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AERONAUTICS DIVISION

Southern FLIGHT

AERO

AUGUST 1949
35 cents

Including MODERN AIRPORTS

EXPERIMENTAL TWIN BONANZA

(See page 8)

speed →

safety →

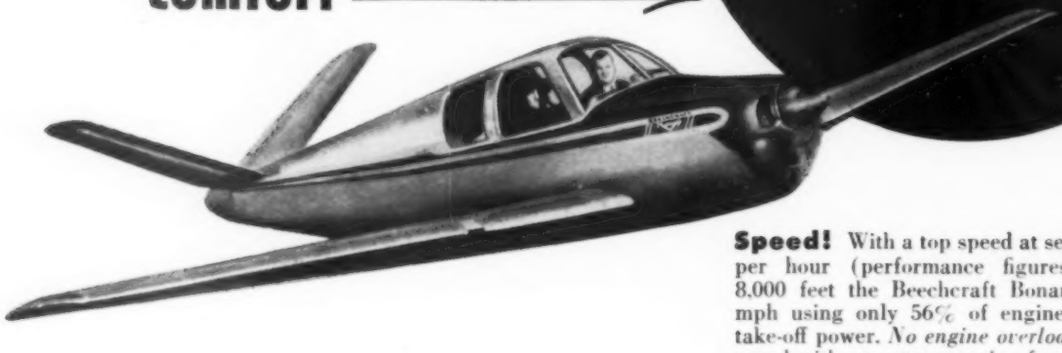
economy →

ruggedness →

comfort →

. . . combined for greater value in the

Beechcraft BONANZA



Speed! With a top speed at sea level of 184 miles per hour (performance figures guaranteed), at 8,000 feet the Beechcraft Bonanza cruises at 170 mph using only 56% of engine's maximum rated take-off power. *No engine overload*, so you get extra speed with an extra margin of safety.

Safety! Rated in the *utility* category at *full gross weight*, with a limit flight load factor of 4.4 G's, the Beechcraft A35 Bonanza has been subjected successfully to special, additional tests not required by CAA. Sturdy framework is the secret.

Ruggedness! Just for example, check the low and sturdy landing gear, with its wide tread and long wheel base, and struts exclusively cross-braced. Nose gear position plus long wheel base eliminate pitching, allow greater braking without excessive nose wheel load.

Economy! This Beechcraft has a fuel consumption of only 9½ gallons per hour at cruising speed. It carries four people and more than 135 pounds of baggage at a seat-mile cost of as low as 1¼ cents. You get the *extra speed* you want plus this important *extra economy*.

Comfort! The unique retractable step preserves feminine dignity. The wide sedan-type door and folding front seat help make getting in and out of this Beechcraft as easy as the family car. Plenty of room to stretch out; cabin really sound-proofed.

These are only a few of the reasons why the Beechcraft Bonanza is a better buy! *See* it today! A note on your company letterhead will bring illustrated brochures describing the Beechcraft Bonanza's many *extra* advantages. Write to Beech Aircraft Corporation, Wichita, Kansas, U. S. A.

Compare these performance features	**Compare these comfort features**
Top speed, 184 mph	Exclusive retractable step
Cruising speed, 170 mph	Limousine entrance
Range, 750 miles	Insulated, sound-proofed cabin
Service Ceiling 17,100 feet	Quickly removable rear seat
Fuel economy, 9½ gal. per hour	Luggage compartment accessible two ways

Beechcraft

BONANZA

MODEL A35

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

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REG. U. S. PAT. OFF.

AUGUST, 1949 VOL. XXXII, NO. 2

Southern FLIGHT

Including MODERN AIRPORTS

COVER: Artist's sketch of Beechcraft's new experimental Model 50 Twin Bonanza, for which preliminary design estimates are said by Beech to indicate a range of 1,000 miles at a cruising speed of more than 180 mph. Tooling has already started on the $30,000, 6-place tricycle and first flights are expected to begin this Fall, with deliveries planned early in 1950.

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Published Monthly by

AIR REVIEW PUBLISHING CORPORATION

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Editor and Publisher

TOM ASHLEY, managing editor. FRED N. STONES, JR., business manager. E. H. PICKERING, editorial research. Field Representative: BOB WEMPLE.

AIR Report

HR 4177, known as the Independent Offices Appropriations Bill, clarifies the intent of Congress with regard to GI FLIGHT TRAINING by providing that "education or training for the purpose of teaching a veteran to fly or related aviation courses in connection with his present or contemplated business or occupation shall not, in the absence of substantial evidence to the contrary, be considered avocational or recreational when a certificate, in the form of an affidavit supported by two corroborating affidavits, has been furnished by a physically qualified veteran stating that such education or training is desired by him for use in connection with his present or contemplated business or occupation."

CAB has proposed to amend CAR Part 45 so that SCHEDULED INTRASTATE OPERATORS WILL BE SUBJECT TO THE SAME SAFETY REGULATIONS as those which apply to scheduled interstate air carriers. Additional safety requirements would include company communications and dispatching systems, pilot route qualifications and company maintenance organizations. However, the CAA Administrator would be permitted discretionary power in individual cases.

MIDGET ENTRIES IN THE NATIONAL AIR RACES September 3-5 in Cleveland, Ohio, include a shoulder-wing pusher built in St. Louis by George Owl and Don Short of the McDonnell Aircraft Corporation's guided missiles department and Errol Painter of the firm's F2H design department. Herman (Fish) Salmon's LeVier Special, which won the Goodyear Trophy last year, will race again but Salmon has agreed not to pilot himself because of Lockheed's policy against commercial racing by test pilots. . . .WINNING LIGHTPLANE DESIGN IN CONTINENTAL MOTORS' 1949 COMPETITION at the University of Detroit is for a 4-place personal plane powered by a single E185 engine submerged in the fuselage behind the cabin and driving two counter-rotating pusher propellers in the wings. Design performance includes 164-mph. cruising speed, 62-mph. landing speed, 1,000-mile range and 2,928-lb. gross. . . . PIPER AIRCRAFT HAS ATC'ED A FLOAT VERSION OF ITS 4-PL., 115-HP. CLIPPER, priced at $4,907.18 complete with floats and corrosion proofing. . . . Piper has received a U. S. Air Force order for 105 65-hp. L-18-B liaison planes for Turkish government training.

LUSCOMBE'S 2-PL. AIRPLANE BUSINESS is for sale and several bidders are being considered. Over 5,000 Luscombes are flying and provide a good parts business for the successful bidder. . . . WALT ST. JOHN has been named general sales manager of Aeronca Aircraft Corp. He formerly served as sales manager for Piper and Fairchild's personal planes department. . . . DICK BOUTELLE is the new president of Fairchild Engine and Airplane Corp., following victory by SHERMAN M. FAIRCHILD in a stockholders battle which terminated with the resignation of CARLETON F. WARD, JR., who had fired Boutelle for sympathizing with Fairchild's policies against Ward's. Now Fairchild and Boutelle, formerly vice president, are reorganizing the firm. . . . C. C. PEARSON, for 16 years with Douglas and more recently head of Curtiss-Wright Airplane Division, has succeeded GLENN L. MARTIN as president of the Martin Company, with Mr. Martin becoming board chairman. ★ ★ ★

SOUTHERN FLIGHT, August, 1949. Vol. 32, No. 2. Published monthly. Publication office, P. O. Box 750 (1901 McKinney Ave.) Dallas 1, Texas. Price 35c single copy. Subscription rates: United States, one year $3.00; two years, $4.00; three years, $5.00. Established February, 1934. Entered as second-class matter at the Post Office, Dallas, under the act of March 3, 1879. Copyright, 1949, by Air Review Publishing Corporation.

The Birdmen's Perch

By *Major Al Williams*, ALIAS, "TATTERED WING TIPS,"
Manager, Gulf Aviation Department, Gulf Bldg., Pittsburgh 30, Pa.

Went to an air show.

This one was at Westchester County Airport; sponsored by the New York State Dept. of Commerce, by Westchester County, and by the airport management.

The airlines were pretty smart.

Six of them sent planes and crews up to the airport, complete with pamphlets and other literature on flying. They put loading ramps on the planes and invited the public in for a look-see. The best looking stewardesses in the business answered questions about airplanes and air travel.

And borrowing a page from barnstorming days, several of the lines filled up their planes with load after load, at $3 a head, and gave 'em many-minute hops over the area.

Between 50 and 80 per cent of the hoppers were making their first flight. But we'll bet it won't be the last flight for a heap of 'em!

We think the airlines showed a pretty keen sense of public relations in this case. We think it'll pay off, too.

We congratulate 'em!

To 80% of the private pilots

The engines of 80% of U.S. private aircraft have horizontally opposed cylinders.

For these engines, the world's finest lubricant is Gulfpride Aviation Oil—Series D!

Series D cleans foreign matter from these engines, keeps it separated and in suspension. Consequently, operators who use Series D are extending overhaul periods to 1000 hours and over!

Series D frees stuck valves and keeps them free longer; it practically eliminates stuck rings.

And the name Gulfpride tells you old-timers that this super-lubricant has gone through Gulf's exclusive extra refining step, the Alchlor Process, which gets up to 15% more impurities out of already refined oil!

Don't worry about your engine being dirty . . . you can use Gulfpride Aviation Oil—Series D—in dirty engines or in clean ones.

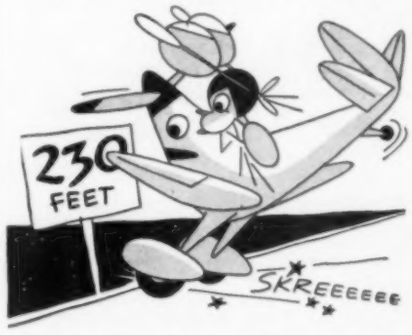
If you put your mind to it, it shouldn't take you any more than the next 24 hours to try Gulfpride Aviation Oil—Series D—in your own lightplane engine.

What are you waiting for?

Little Known Facts Dept.

We like this Little Known Fact About Well Known Planes. And to prove it, we're sending a Commission as Perch Pilot (bottom rung) to Bill Curry, in Milledgeville, Ga.

"The AF's L-13 can take off and land in the distance covered by the B-36's wing span!



The L-13 gets off in 230' and back on in 227'. The 36 spans 230'!"

A very fancy "Fact," Bill, and wouldn't you think more guys would send proof with their contributions?

We've got files full of "no-proof" Little Known Facts which means that a lot of the fellahs are lurching through life unwept, unhonored and unsung because they haven't one of our magnificent, genuine-type commissions as Perch Pilot (br).

And the poor things'll just never be able to get the Senior Perch Pilot rating that we hand out for 5 published, *proved* "Facts."

What a pity!

All they have to do is write to us at the address above—sending *proof*—too.

Gulf Oil Corporation and Gulf Refining Company . . . makers of

GULF **GULF AVIATION PRODUCTS**

NEXT TIME YOU'RE ON THE FIELD WILL YOU TAKE A LOOK AT YOUR FIRE EXTINGUISHER?
MAKE SURE IT'S IN FILLED, USABLE SHAPE WITH THE SQUIRT HOLE UNPLUGGED.
SKUSH!
CARELESSNESS ABOUT THIS MIGHT LOSE YOU A PLANE— AND THEN WE COULDN'T SELL YOU...
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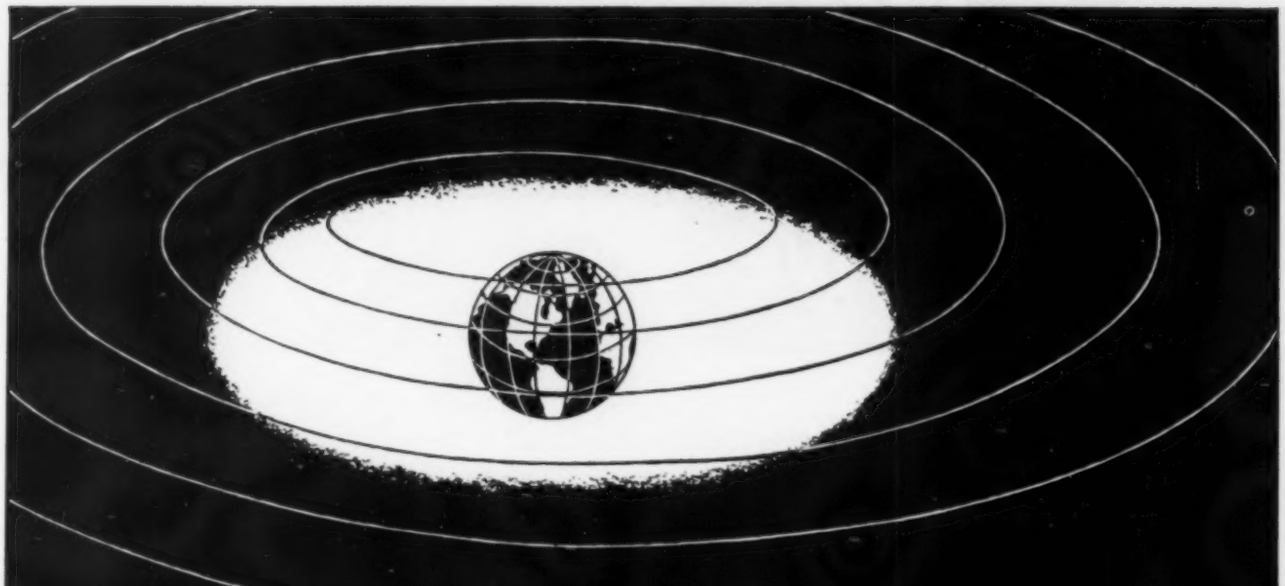

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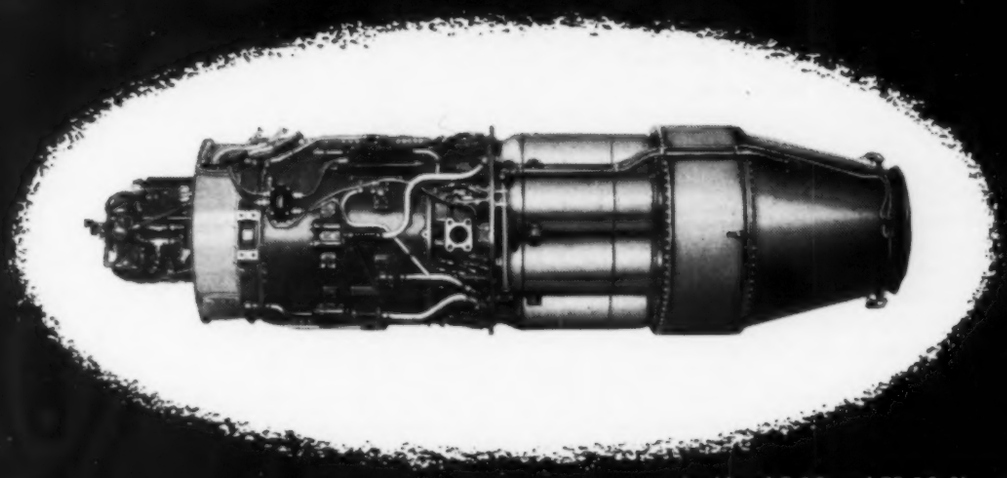

J35 Axial-flow Turbo-jet

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Northrop RB-35B Flying Wing
Martin P4M-1 Mercator
North American AJ-1

Allison

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Indianapolis, Indiana

Builder of axial and centrifugal flow turbine engines

Just among ourselves

EDITORIALS

WHOSE RESPONSIBILITY?

THERE is a move on foot to find out what can and must be done to encourage the development of aircraft designed specifically for agricultural work. As everybody knows, practically all airplanes used for dusting, spraying or seeding have been compromised conversions from airplanes designed originally for other purposes. Today we have the spectacle of discarded military training planes and little two-seaters being used for the application of chemicals to millions of acres of crops each year. Now a multi-million dollar annual business, agricultural aviation is stymied for lack of flying equipment specifically designed for the work.

At the risk of being challenged, we believe that the only new airplane designed specifically for a new purpose in the last decade is the Fairchild "Packet" often called the "Flying Boxcar." Yet it is a military design not yet used in commercial operations. While improvement has been constant in the realm of commercial air transport, military and private owner aircraft, there has been absolutely no progress in airplanes for agricultural purposes or for short-haul feeder type transportation. With Civil Aeronautics Board approval of single-engine aircraft for certain feeder airline routes it seems logical to believe that the manufacturers will get busy and produce a small multi-engine short-haul transport which will replace the single-engine interim equipment. But there is no promise of any development work on aircraft for spraying, dusting or seeding. And with a definite aversion on the part of the manufacturers for the Civil Aeronautics Administration to engage in aircraft developmental work, just how far CAA will attempt to go in the matter of accelerating developmental work in agricultural aviation is highly problematical, especially when certain topside officials in the CAA have a kindred aversion to developmental enterprises.

Present efforts to get something going consist principally of exploratory leg work by a small nucleus of independent Southwestern airmen who have already done much to spearhead national interest in agricultural aviation. This small group was responsible for the widely disseminated piece in the Congressional Record by Senator Elmer Thomas of Oklahoma. At this writing they are conferring with Civil Aeronautics Administration and Department of Agriculture Officials in Washington as well as many congressmen and senators who have expressed an interest in the problem.

Of course the intelligent development of agricultural aviation goes far beyond just the technical problems and work involved in providing a better airplane. Research in an experimentation with chemicals and flight techniques for fool-proof application are all a part of the total problem. For example, the oat crop in the South is almost a complete failure this season due to plant lice. There has been no research carried on for the development of an effective insecticide for oat lice. Dispensing of the agent by ground methods would destroy as much of the crop as the lice. Only airplanes or helicopters can do the job effectively without damage to the crop. Considerable experimentation is needed in killing off shinnery and scrub growth in the western cattle country by chemicals sprayed from aircraft. The present grasshopper plague in the western states is being fought with aircraft but under emergency conditions with little or no precedent to go by. Many towns throughout the nation have called on commercial operators and military reserves to spray their areas with DDT, hoping to cut down the polio epidemic. But little is known about the effectiveness of such projects.

These few instances clearly point out that the implications of teaming up the airplane with chemicals go far beyond what most people consider today as agricultural aviation. The very health and welfare of the entire nation is involved. In view of that fact it seems to us that the Federal government has a definite stake in the matter even to the extent of the military air services getting in on the act. They are always called upon in emergencies so why not let them acquire some flying equipment that can do the emergency job economically and effectively instead of converting conventional transports and fighter planes for jobs they were never designed to do?

It would be admittedly far better for private enterprise to resolve the dilemma. But this does not seem likely. No company, group, association or private foundation now interested in this field has the funds or staff available. Plenty of them have the interest and moral support which are necessary ingredients. But the actual program of accelerating the development of aircraft specifically for such purposes will have to be spearheaded by Uncle Sam through one of his agencies directly concerned with the problems involved or the desirable ends to be achieved, working in unison with all of the private interests now ready to assist and co-operate.

Many organizations such as the Flying Farmers, many colleges and universities, other interested Federal agencies such as the Departments of Agriculture and the Interior and a host of private corporations, aviation companies and research institutions recognize the immediate need for co-operative action in many phases of agricultural aviation.

Let's hear from the recently created Office of Aviation Development within the Civil Aeronautics Administration. The general order setting up this new Office specifically charges it with the responsibility of such work. Surely it will recognize the problems of agricultural aviation as priority projects, worthy of immediate action. If it fails to seize the initiative in this tremendous field of aeronautical endeavor in the near future it is clear that the Civil Aeronautics Administration will revert back into a predominantly regulatory organization with only a casual interest in fostering and developing civil aeronautics in the United States. Pure lip service will not produce an agricultural airplane. ★ ★ ★

COMPARE

SOUTHWEST AIRMOTIVE'S facilities for Instrument Overhaul

Equipment (l. to r.): Altimeter bell jar test stand, altimeter monometer, manifold pressure gauge, airspeed test stand, sensitive drill press, tachometer test stand, electrical test bench with auxiliary units, magnet charger, and a stroboscope.

SAC gyro instrument bench (l. to r.): Universal fixture for balancing instruments, directional gyro test stand, still-check mount for artificial horizons, calibrated turn and bank test stand.

The SAC Instrument Shop has always been a standby of the Western Hemisphere's most experienced private pilots. Now, this famous shop has been made even finer through a program of expansion and improvement.

We invite you to inspect the Southwest Airmotive Instrument Shop. COMPARE it with others before having your next instrument job performed.

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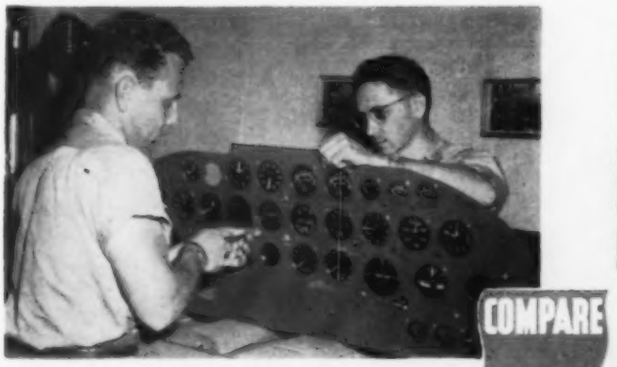
Equipment
Trained personnel
Complete flat rates on labor

All work in the SAC Instrument Shop is guaranteed, backed by a 17-year record of square-dealing.

If you buy surplus instruments, be safe and let us inspect them before you use them . . . if you are using factory-new instruments, come to SAC for FACTORY-AUTHORIZED service . . . if you need instruments, make your selection from our stock of famous-name units.



This unique Lockheed Lodestar panel, in a single piece instead of the standard three, is typical of the custom jobs performed by the SAC Instrument Shop in accordance with customers' specifications.

Actual repairs and overhauls are accomplished at individual work benches, with precision instruments. Factory and CAA directives are followed strictly.

THE FLAT RATE COMPANY

Southwest Airmotive Co.

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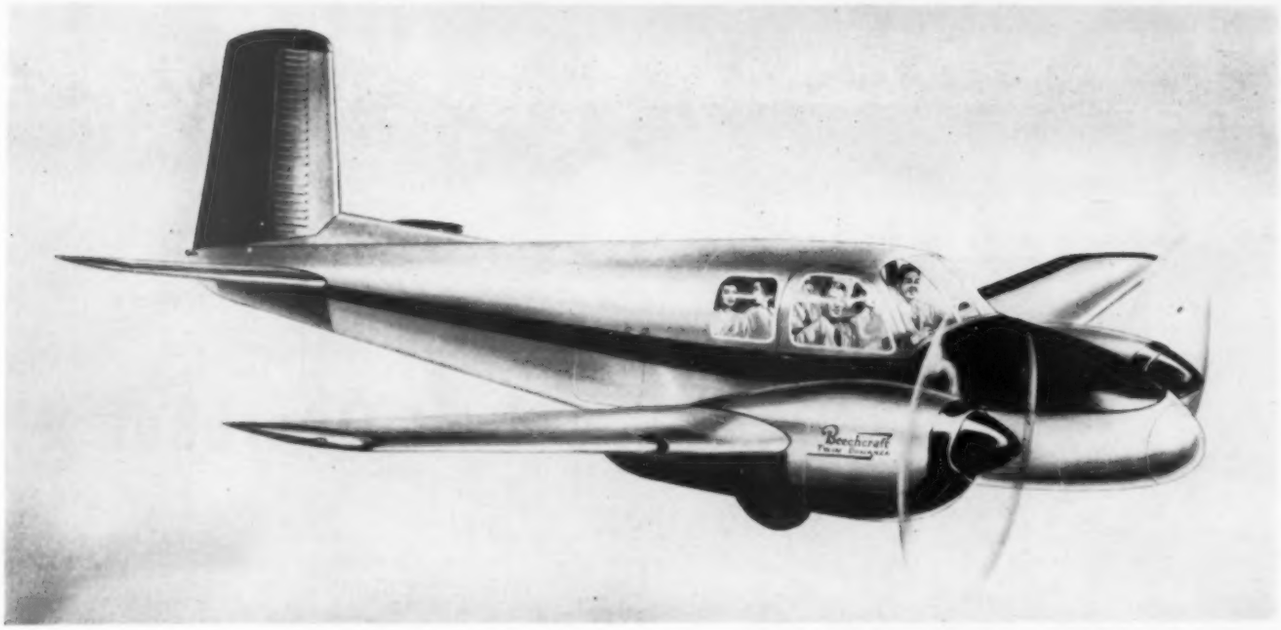


Twin Bonanza, latest Beech experimental project, is now in mock-up at Wichita. This sketch from Beech shows six occupants, three on each seat. Engines will probably be 240-hp. flat Continentals. Tricycle gear is indicated. Performance figures for proposed $30,000 craft include 1,000-mile range at 180-mph. cruising speed. Beech expects a "good" single-engine ceiling at gross weight.

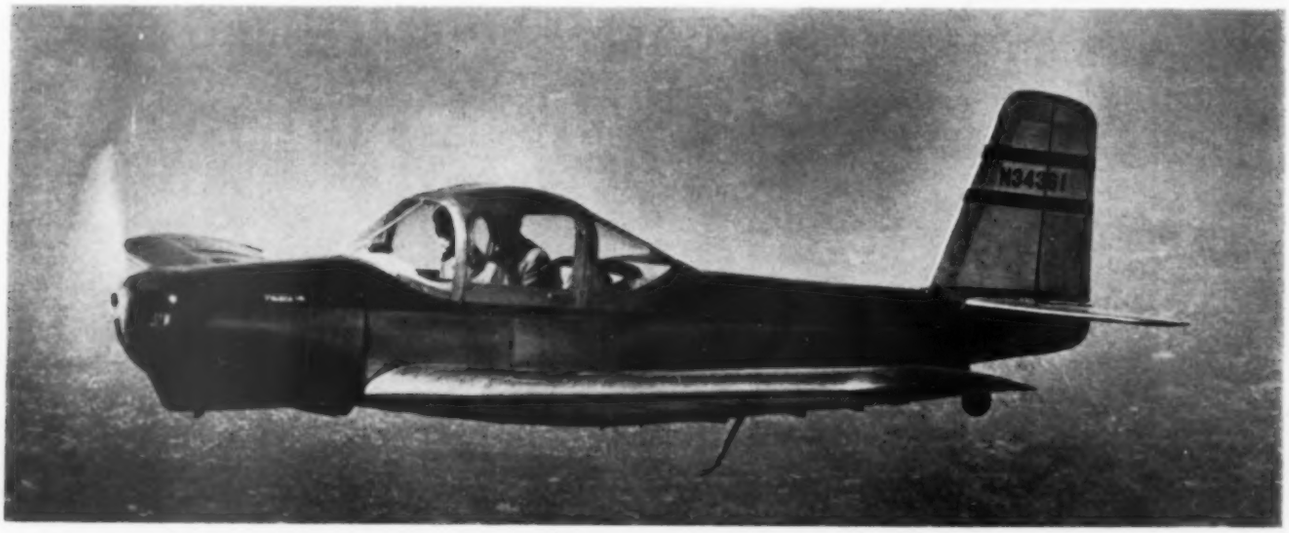
The Search for Higher Performance

By TOM ASHLEY

NEW designs to meet demands long expressed in private flying ranks include three interesting airplanes: (1) Beechcraft's new Twin Bonanza, (2) Meyers Aircraft's high-performance 2-place Model 145 and (3) Lanier Aircraft's ambitious little high-utility "Paraplane" with variable "Vacu-jet" airfoil. Only the latter two of them are flying, and only the Meyers is NC'ed and is being produced and sold on the market.

The Twin Bonanza represents the latest Beech experimentation. Preceding it were the two engine-one propeller experimental Bonanza, and the four engine-two propeller Twin Quad transport. The former features a conventional Bonanza airframe powered by two 100-hp., 4-cylinder flat engines, mounted one atop the other in the nose, driving a single propeller through a gear and clutch arrangement. Beech has never formally released details on this project and has privately made it clear to all inquirers that the gear-box and clutch project involves power plant problems which may take years to overcome. When finally the company announced its Twin Bonanza project with engines in the wings, it appeared that maybe the gear-box and clutch project had been dropped. But this has been denied and a spokesman

Two-place performance in Bonanza category of about 160 mph. for cruising is claimed for this $6,000 Meyers, powered by 145-hp. Continental. It was NC'ed some time ago. Six have been built on custom basis at Tecumseh, Michigan, plant.
—(Meyers Aircraft Photo.)



insists that the earlier experimental is still being studied.

Twin Bonanza in Mock-Up Stage

All that Beech has announced on its latest project is an artist's sketch and the following brief memorandum: "Beech is working on a 2-engine Bonanza of conventional type. Designated the Model 50 Beechcraft, it is designed primarily as a 5-pl. airplane but can accommodate six people for short-range flights. Preliminary estimates include a cruising speed of over 180 mph. at 1,000-mile range, with good single-engine ceiling at gross weight. No deliveries are expected prior to early 1950, and present estimates indicate the price will be approximately $30,000 as delivered complete."

It has been learned that the Twin Bonanza is now only in the early mock-up stage of development. Flat engines are indicated in the Beech sketch and probably will be 240-hp. Continentals. Full-feathering propellers appear to be called for, as is nose-wheel landing gear.

Prospects for small airline operations as well as the executive aircraft market influenced Beech's decision to launch the Twin Bonanza. Competition was probably another factor, since two other small twins have evoked considerable discussion in recent months. These are the Aero Commander and the Baughman Brigadier, both having engines in the 190-hp. bracket.

Spartan Executive

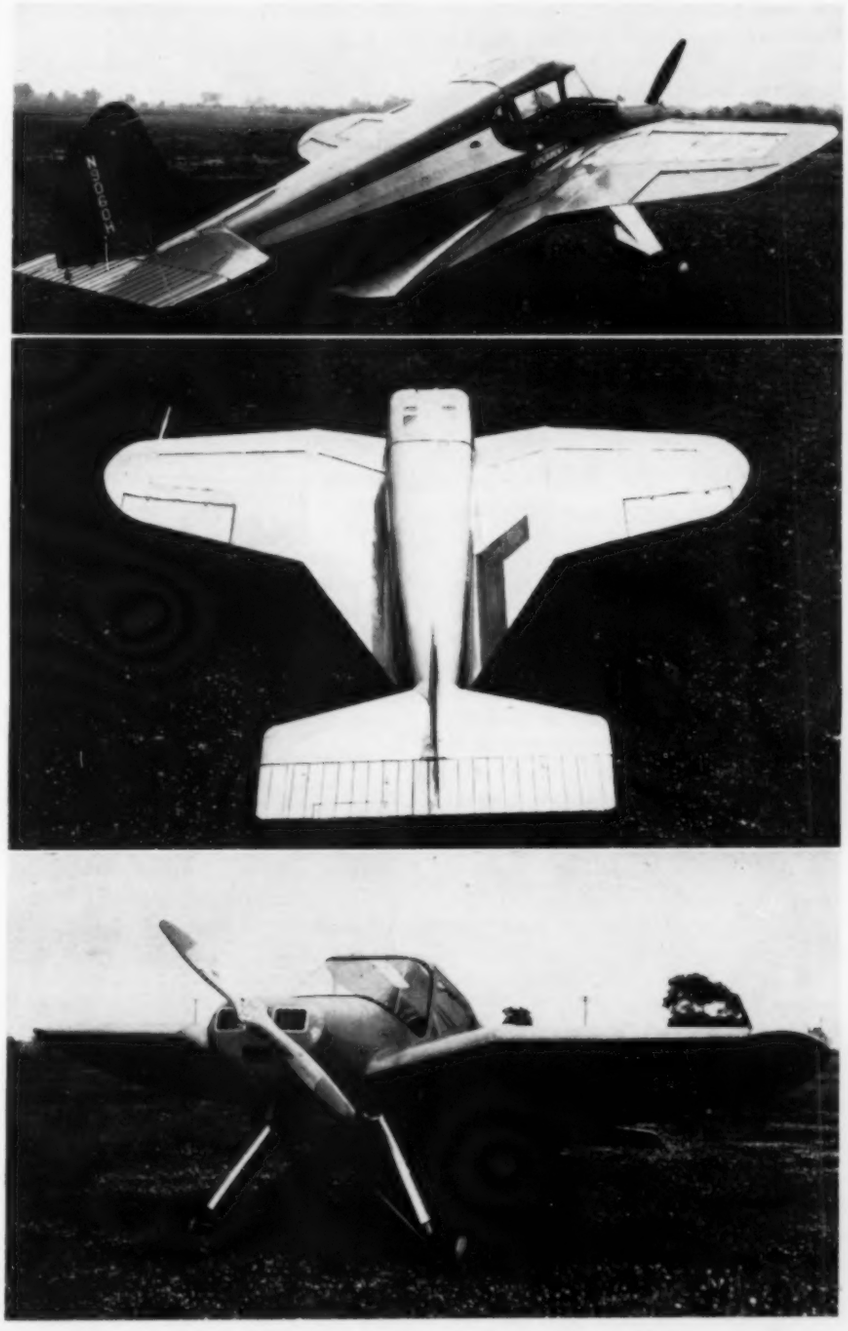
Another entry in the $30,000 competition is Spartan Aircraft at Tulsa, which has flight-tested extensively for many months its postwar single-engine Pratt & Whitney-powered 5-pl. Executive with nose wheel. Captain Maxwell Balfour, in charge of the Executive project, has said all along that it would be placed in production if, as and when a market for it and production costs for it become favorable. Until now he has estimated it would have to sell at $40,000. It is generally believed Spartan will become active with the new Executive if a $30,000 price can be met. Capt. Balfour has averaged 195 mph. cruising speed on many cross-country trips in the airplane, reporting his costs included $6.60 worth of gas per hour. This performance would be difficult to match in a twin-engine airplane.

160-Mph. Meyers 2-Pl. Model

Among smaller private planes, the Meyers Model 145 offers performance which has long been awaited in the 2-place category. It was NC'ed some time ago and six have been produced at the Tecumseh, Michigan, factory on a semi custom-built basis. Meyers, who produced trainers during the war, has not promoted his 2-pl., taking a calm view of such things as market demand and so-called "mass" production. Without grandiose plans, he is quietly perfecting his version of what a high-performance, deluxe 2-pl. ought to be and makes no bones over costs, which right now are quoted at about $6,000, fully-equipped.

All-metal and with tail wheel and retractable gear, the Meyers is powered by a 145-hp. Continental. Specifications and performance data, as obtained from its CAA Approved Type Certificate No. 3A1-1, include the following: Sea level cruising speed, 145-155 mph.; altitude cruising speed, 162 mph.; sea level landing speed with 45 degrees of flaps, 42 mph.; never-exceed speed, 200 mph.; rate of climb at sea level, 960 fpm.; take-off run at sea level into 5-mph. wind, 350 ft.; landing run at sea level into 5-mph. wind, 375 ft.; maximum range, 4 hrs. with 30 mins. reserve (600 miles); empty weight, 1,135 lbs.; useful load,

(Continued on page 20)



Patented "Vacu-jet" airfoil, which is variable and controlled from cockpit for steep climb and descent and control at speeds in the thirties, features 90-hp. Lanier "Paraplane." Lanier Aircraft Corp., Marlton, N. J., plans to offer its patents to aircraft industry if project proves successful.

—(Lanier Aircraft Photos.)

Service After the Sale for Beechcraft

Factory field work with owners through authorized service stations makes fo

By PAUL E. ALLEN
Beechcraft Chief Service Engineer

BEECHCRAFT'S new customer service program has been received by Bonanza owners with considerable enthusiasm during the past two months and it now appears to be a successful operation. This program which is being conducted jointly by Beechcraft distributors, direct dealers and Beechcraft factory representatives is an unprecedented good will gesture by the Beech Aircraft Corporation.

The final objective of Beechcraft's service program is a nation-wide customer service organization that can give complete efficient, economical and outstanding service to private plane owners. At the service stations in this organization, the private plane owner can expect facilities with equipment, material and personnel capable of servicing or repairing his airplane efficiently and economically with flat-rate charges for many service operations.

Factory Teams in Field

The physical operation of this program is comprised of several phases functioning as follows:

The first phase consists of sending two-man factory service teams to our distributors and direct dealers for a period of several days to inspect Bonanzas and assist our distributors' service personnel. Special invitations are mailed to each Bonanza owner in the territory approximately ten days prior to the scheduled free inspection. A follow-up is made to arrange a definite schedule for each Bonanza several days prior to the scheduled free inspection.

When each Bonanza arrives the owner is greeted and given a general briefing on the purpose of this service program. His Bonanza is then completely gone over by the two factory representatives, who check ninety separate items or more for proper adjustment, operation and condition such as the landing gear, the engine accessories and fuel lines, baffling and controls.

On completion of the general inspection, a copy of the completed inspection form with pertinent remarks as to the general condition of the Bonanza is given to the owner along with a letter which makes recommendation for the accomplishment of any maintenance work which should be taken care of to assure a maximum of trouble-free utility and performance from the airplane.

In conjunction with this inspection program, a special service follow-up program has been initiated. This service follow-up system consists of sending a special letter of thanks to the owner of each Bonanza that has been worked on in a distributor's shop approximately one week after the job is accomplished. This service follow-up letter has a detachable tab conveniently addressed to the Beechcraft Engineering Service Division and marked for the owner to make his comments on the service work which he obtained. A follow-up of any reported service deficiencies at any Beechcraft service station will be made and corrective action taken to assure all aircraft owners that Beechcraft service stations are reliable and dependable.

This initial phase of the program gives the Bonanza owner an opportunity to evaluate the service facility accomplishing his maintenance work. It also gives the Beech factory an opportunity to check on the service and maintenance items being overlooked, thereby enabling the factory to properly instruct each service station in the proper methods of overcoming this service oversight. These double checks

How Beech Program Works

BEECHCRAFT CUSTOMER SERVICE

This Customer Service form is rigidly followed by factory teams who visit each Beechcraft Certified Station and check—without charge—every owner's Bonanza. Over 90 items are on the list. A copy of the completed inspection form is given to the owner, along with a personal briefing about service. A second copy is furnished to the Service Station and a third copy is retained by the factory for follow-up.

BEECHCRAFT CUSTOMER SERVICE

This "follow-up" mailing piece is sent to each owner from the factory, asking for comments and constructive criticism on the recently-performed service operation. Using the blank at the bottom, every Bonanza owner has a chance to express his opinion on service.

It's time for Spring Cleaning
FOR YOUR Bonanza TOO.
BRING YOUR BONANZA BACK TO OUR BEECHCRAFT SERVICE STATION FOR A CHECK-UP
DEALER'S NAME

Here's a typical seasonal mailing piece used by the factory and Certified Service Stations. It is a large postcard, mailed as a reminder to the owner to take his Bonanza to a Beechcraft Service Station for a check-up. Both the factory and its dealers maintain up-to-date customer card files on servicing. To obtain approval as a Beech-certified Service Station, dealers must meet numerous factory service and equipment requirements. These include items listed on typical page from Beechcraft directory of approved stations as shown on the opposite page.

Owners

for better Bonanza utilization

give each owner the assurance that each Beechcraft certified service station (1) is properly checked on by the factory for the performance of their service functions, (2) is instructed by the factory in the latest service techniques to overcome service problems, and (3) has the latest service aids and data compiled by the accumulated experience of all Beech service stations for their ready reference.

The following quotations from letters of appreciation by Bonanza owners express the typical owner reaction to this phase of Beechcraft's new service program:

"I wish to say that your factory service inspection program proves that you do not lose interest in your customers after the sale is made." . . . "I greatly appreciate the factory service inspection given to me by Mr. Gaston and Mr. Sampson, of your Engineering Service Division. It made me a very proud owner of the Bonanza and gave me further confidence in flying and owning a Beechcraft." . . . "Sampson inspected our two Bonanzas and gave us much valuable information. He seems thoroughly capable, has a marvelous personality and is certainly a credit to the Beech organization." . . . "I wish to express my appreciation to you and the Butler Company for your fine co-operation." . . . "I had my Bonanza in for your free inspection last Monday, and am very much pleased with the efficient and courteous service rendered by the factory and by the Butler personnel."

TEXAS
HOUSTON

A Beechcraft Certified
SERVICE STATION

J. D. REED CO., INC.
(Beechcraft Distributor)

Municipal Airport - Tower Frequency 278 and 118.7
Paved Runways - Field Lighted
Services - 6 a.m. to 8 p.m., 7 days a week
Fuel Available - 80, 91 and 100 Octane, 24 Hours Daily

SERVICES AVAILABLE TO BEECHCRAFT CUSTOMERS

AIRPLANE REPAIR	35	18	17
ROUTINE LINE CHECK	X	X	X
GENERAL TROUBLE SHOOTING AND MAINTENANCE	X	X	X
SPARE PARTS STOCKED	X	X	X
MAJOR REPAIR	X	X	X
ENGINE REPAIR	X	X	X
ENGINE OVERHAUL	X	X	X
ENGINE EXCHANGE	X	X	X
INSTRUMENT REPAIR	X	X	X
INSTRUMENT EXCHANGE	X	X	X
RADIO REPAIR	X	X	X
RADIO EXCHANGE	X	X	X
PROPELLER REPAIR	X	X	X
PROPELLER EXCHANGE	X	X	X
STORAGE	X	X	X

COURTESY	
HOTEL RESERVATIONS (WHEN REQUESTED)	X
LIMOUSINE SERVICE	X
CAR RENTAL	X
TAXI SERVICE	X
BUS SERVICE	X
PLANE RENTAL	
PLANE CHARTER	X

SPECIAL FIELD FACILITIES	
TRANSIENT ROOMS	X
DINING ROOM	X
LUNCH COUNTER	X
RECREATION	X
AIRLINE CONNECTIONS	X

Phone: Wydown 91201

Here's typical page from Beechcraft Certified Service Station Directory, given by factory to each owner to show service which can be expected from each station.

A Bonanza owner, Richard E. Seaman of Albany, N. Y., stands by and observes Beech factory service team inspect his airplane. He had been notified several days in advance that the free factory inspection would be performed at Atlantic Aviation's service station. Over 2,000 Bonanzas have been delivered by Beech and each owner is receiving periodic follow-up service through both the factory and its dealers.
—(Beech Aircraft Photo.)

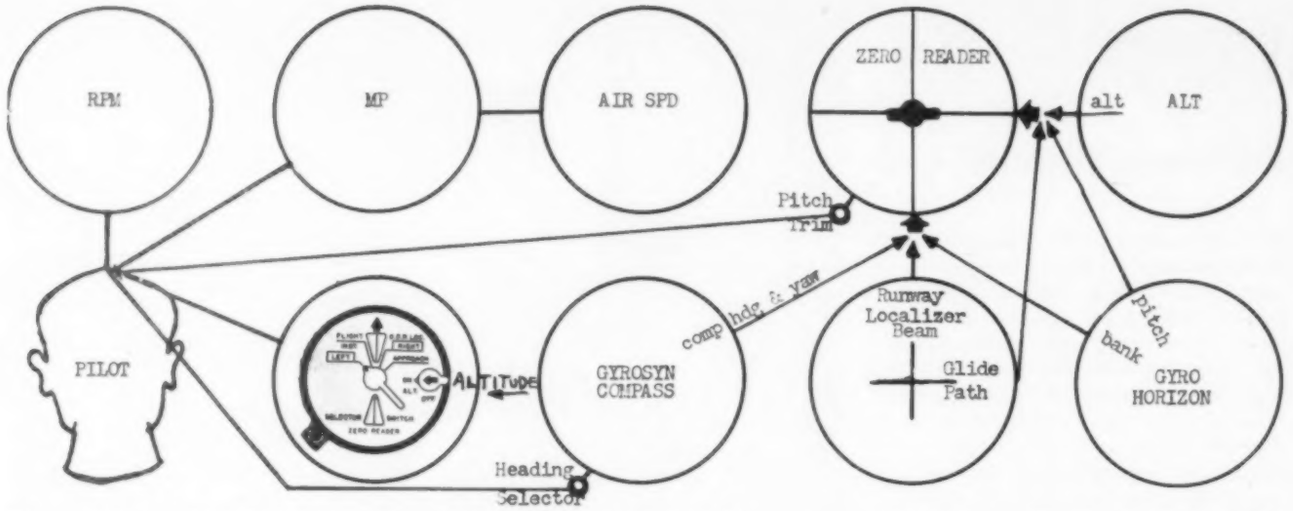
Standards for Certified Stations

The second phase of the program consists of the establishment of basic requirements for Beechcraft certified service stations. These requirements will consist of a modification of the basic Beechcraft certified service station requirements established in 1948 to incorporate changes to overcome the deficiencies observed in the nation-wide free-factory service inspection of Bonanzas which is now being conducted. Upon completion of these revised requirements, a review of Beech service facilities will be made and those stations meeting Beechcraft standards will be listed in a new directory which will be distributed to all Beechcraft owners as a guide to better service.

The third phase of the program consists of the preparation of special seasonal service inspections and checks that will be run by Beechcraft service stations to provide more efficient trouble-free airplane operation. The factory will prepare special detailed inspection and service checks which will be given to every Beechcraft service station with proper instructions for properly conducting the operation. In conjunction with these seasonal checks the Beech factory will provide each service station with special mailing cards to act as a reminder to the owner that he should have his Beechcraft service station check his airplane for maintenance items which if left to get progressively worse will cause costly or inconveniencing delays for repairs.

The fourth phase of the program is to establish a permanent field service group of factory representatives who will inspect all Beechcraft service stations and instruct their personnel in the proper methods of maintenance. This will insure owners that Beechcraft service stations have the latest service information and know-how on Beechcraft maintenance and that they need not expect costly experimentation by unfamiliar mechanics in trying to locate and correct irritating items.

To sum up this new unprecedented service program, the owner deserves all possible service after the sale and that is exactly what Beechcraft is striving to accomplish through its service program. ★ ★ ★



This panel diagram identifies the seven types of signal information, indicated by arrows, used by the Sperry Zero Reader. Its horizontal bar uses three types: Pitch, altitude or glide path. Its vertical bar uses four types: Bank, yaw, compass heading and runway localizer or VAR or VOR. As shown at left, pilot must control air speed by proper power settings, Zero Reader Selector switch, heading selector on gyrosyn compass and pitch trim knob on Zero Reader for climb or descent.
—(SOUTHERN FLIGHT Diagram).

Zero Reader

An electric 'brain' to help the pilot stay in the groove

By
FRED K. DICK

ONE application flying the Sperry Zero Reader will convince you. Keep those cross-bars centered and you are zeroed. Zero and you are on the localizer beam. If you aren't on it, remember to zero and you know you are making one swell bracket at it. Keep on zeroing and you know your oscillations and turns are being kept to a minimum. Zero and you are lined up, flying a groove, or soon will be. There's no sneaking up on the beam, no calculating course corrections. Just zero. You can't spin in. Bank the ship 20 degrees and you are zeroed. Dive or climb 6 degrees and you are zeroed.

You do have to control your air speed with engine power. Even a ZR can't climb without power! You do have to select and set up on the selector switch what you want the ZR to indicate for you. It is also good practice to check up on the ZR by checking your other instruments to see where it is flying you.

Pilot Unfamiliar With ILS | Pilot Familiar With ILS | Zero Reader

These sketches illustrate the effectiveness of the Zero Reader in smoothing out the bracketing of both glide path and runway localizer beam during instrument approaches.
—(SOUTHERN FLIGHT Drawing).

When the cross-bars are like this:

you apply left aileron and back pressure and the bars instantly return to this:

When you are below altitude, the cross-bars look like this:

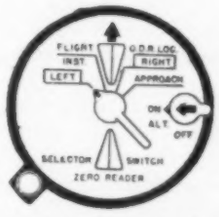
You apply a little back pressure and it centers the bars like this:

The Zero Reader reacts quickly, as if the cross-bars are saying, "That's just right—now your nose is up enough and you're picking up your altitude at the right rate." Then you notice the cross-bars move like this:

as if saying, "You're just about there, so apply a little forward pressure and you've got it in the groove." That's what you do and the cross-bars center on zero again.

During all this you don't stop and figure things out. You and the Zero Reader work together pretty smoothly from the start. It's always giving you the right dope and you like that, without questioning.

Gee, here we are zeroed again. It must be that Sheridan influence. So let's stop and look at the illustration of a flight panel (top of page). While you are looking at the panel, I can say some things right fast. First, you need an airplane to put the Zero in so you can zero. Second, the airplane should have flight instruments and radio equipment as shown by the illustration. I hope you're still looking at it. Third, you can't zero without laying 4,500 Roosevelt dollars on the line—plus installation costs. Also, that "Heading Selector" is a gyrosyn compass, which ain't exactly surplus merchandise. Fourth, you need room in the airplane so you can stow an extra 45-lb., 12- or 24-volt control box, the heart and brain of the system. It contains an electrically-driven vertical gyro, an altitude control, an amplifier, signal modifier, combiner and limiter. Zero. I guess a Twin Bitch or larger would just about fit.



Selector switch for Zero Reader has knob with arrow at right for altitude. It is turned to "Off" for climb or descent, for which Zero Reader itself has a pitch trim knob. With the selector switch's altitude control turned to "On" the pilot zeroes to maintain altitude. When switch is turned to "Approach," the altitude control is automatically turned off.

Now, if you are through looking at the illustration, let's taxi out and start zeroing again. Flip on an electric switch and Reddy Kilowatt starts kicking the amplifier tubes, and spinning the gyro. As soon as this is done, he rushes up to the Zero Reader instrument and pulls down out of sight the little safety flags marked "Off," letting you know the instrument is Reddy Freddie (that's me). After you taxi on the runway and line up for take-off, turn the Zero Reader Selector's "Altitude" control to "Off," set the selector switch to "Flight Instrument," set the "Heading Selector" double-line pointer to agree with the single pointer on the gyrosyn compass. Put in some climb component through the "Pitch Trim Knob" on the Zero Reader. *Now let's don't zero yet.* Let's be conventional. I'll take the left throttle and engine and you take the right throttle and engine and I'll race you to the end of the field. After the gear is up and you've beat me to the end of the

(Continued on page 18)

What's Flying and How Many?

WHAT were the most popular airplanes in America during the last fifteen years? For the answers, here are listings showing airplanes by make, model, size, horsepower and year of manufacture. While the CAA records identify 97,619 airplanes in this list, we have included all but those of single or minor issue. Oldest planes still on the records as being licensed when the list was compiled several months ago are four Curtiss JN4's of 1918.

Mfr.	Model Series	Place	H. P.	Year of Mfr.	No.	Totals
Aeronca	C2	1	36	1929-33	11	
	C3	2	36	1931-37	141	
	L	2	70-90	1935-36	31	
	K	2	36-65	1937-39	249	
	65, L3, 058, 60, etc.	2	65-75	1938-46	2,725	
	50	2	50-55	1938-40	116	
	7	2	65-90	1945-47	6,799	
	11	2	65-85	1946-48	2,175	
	Other				310	
						12,649
(Aeronca has delivered 176 2-pl. and 285 4-pl. planes since this compilation)						
Alexander-Eaglerock		2-3	90-220	1927-35		24
American Eaglecraft		2	35-50	1930-45		11
Beech	17	5	225-450	1934-46	289	
	18	7-11	620-1050	1937-48	491	
	AT11	7	900	1942-43	103	
	35	4	185	1946-48	1,406	
						2,289
(Beech 35 and A-35 Bonanzas not total over 2,000 in number)						
Bell	47	2	178	1946-48	105	
	Other				135	
						240
Bellanca	CH	5-8	220-450	1927-35	19	
	149	3	90-95	1940-41	39	
	1413	4	150	1946-48	435	
						492
(51 Bellancas have been delivered since this compilation)						
Boeing-Stearman				1936-43		4,345
Brewster-Fleet				1929-31		114
Buhl				1927-31		16
Call		2	100-125	1943-48		20
Cessna	BW	3	220	1928	1	
	AW	4	125	1928-30	13	
	DC6	4	250-330		2	
	C34-7-8	4	145	1935-38	61	
	T50	5	490	1941-44	1,698	
	C165	4	165	1938-41	47	
	C145	4	145	1938	2	
	120	4	85	1946-48	1,885	
	140	4	85-90	1946-48	4,185	
	190	5	240	1947-48	23	
	195	5	300	1947-48	103	
	170	4	145	1948-49	148	
	Other				890	
						9,059
(Cessna has delivered 33 Model 120's, 184 Model 140's, 696 Model 170's, 30 Model 190's and 187 Model 195's since this compilation)						
Command-Aire		3	90-185	1928-33		14
Commonwealth-Rearwin		2-3	45-165	1930-46		546
Convair-Stinson	SM	4-6	125-450	1927-31	76	
	T	11	630	1930-31	3	
	JR	4	215-250	1931-33	78	
	W	4	300	1931	1	
	U	12	720	1932-33	1	
	SR	4-5	215-450	1934-41	392	
	A	10	780-900	1935-36	4	
	10	3	75-125	1940-42	592	
	HW75	3	75-85	1939-40	145	
	L5	2	190	1942-46	176	
	108	4	150-165	1946-48	4,127	
	V77	3	300	1943-44	192	
	Other				198	
						5,835
(341 Stinsons have been delivered by Convair and Piper since this compilation)						
Convair	16	33	1125	1930	1	
	T8P1	10	900	1937	1	
	PBY5A	9	2100	1942	3	
	BT	2	450	1940-44	3,833	
	240	40	4200	1947-48	15	
	Other				1,283	
						5,136
Culver	L	1-2	75-90	1940-42	277	
	V	2	85	1946	350	
	Other				19	
						646
Curtiss-Wright	JN4	2	90-175	1918	4	
	TR	3	90-220	1926-27	197	
	Robin	3-4	90-260	1928-30	66	
	6000	6	220-450	1928-29	14	
	Fledgling	2	185	1929	8	
	Kingbird	8	660	1931	1	
	Junior	2	45	1931	12	
	Sedan	4	250	1931	5	
	A22	2	420	1938	2	
	C46		4000	1940-44	31	
	Other				145	
						484
Davis	D	2	65-125	1929-33		11
Douglas	A26		4000		11	
	DC-2	13	1420	1934	2	
	DC-3	32	1720-2400	1936-47	922	
	C-54	60	5400-5800	1942-46	262	
	DC-4	60	5400-5800	1946	13	
	DC-6	60	8400	1947-48	100	
	Dolphin	7-10	660-900	1931-34	2	
	B23		2540-3200	1940	7	
	B18		1860-2000	1938	17	
	Other				271	
						1,622

(Continued on page 18)

A Logical Pattern for Local Air Service

By E. H. PICKERING and BOB WEMPLE

PART III

OPERATORS interested in establishing a small airline for local air service and applying to the Civil Aeronautics Board for a certificate of convenience and necessity should recognize at the outset the importance of accuracy in assembling their facts regarding all phases of the business, especially in operating costs and anticipated revenues. Such facts are not as easily obtained and maintained as it may seem. But their vital importance becomes apparent when one considers the requirements involved, from the standpoint of good business practice as well as that of regulations governing airlines.

Those not already familiar with available aircraft and their performance and operating costs have access to this information, not only from manufacturers but from reliable distributors and operators, who can also provide important servicing information and arrangements to supply their services on contracts. But from what source will they obtain all of the information necessary to determine operating costs and revenues? The use of single-engine airplanes until suitable small multi-engine types become available, already approved by CAB and planned to be operated by three airlines already having certificates—Midwest (Iowa Airplane Co., Cessna 190's), Parks (Cessna 190's) and Central (Cessna, Beech or Ryan being considered)—will simplify the task but also will create the need for initiative and ingenuity in planning.

Route structure, number of ground stations, scheduling and necessary personnel and equipment will vary in nearly every case. A practical approach to an analysis of a particular case will be to determine basic operating factors, these being (1) total mileage and total hours flown, (2) revenue miles and non-revenue miles, and (3) revenue hours and non-revenue hours.

Scheduling

In planning your scheduling, consider the traffic needs over your proposed route. On-the-spot studies and research, already suggested in earlier articles of this series, will provide a yardstick. A minimum service in most cases is two round trips daily, one in the morning and the other in the late afternoon. Additional round trips may be scheduled at convenient hours, depending on traffic needs. If you plan to develop the need for air mail service, you will also eventually consider the advisability of a night schedule for mail and cargo only. CAB certification of single-engine aircraft for passengers is for daylight contact flying only but you can operate mail trips at night if and when the need for such service is recognized.

In scheduling, emphasis should be applied at all times to one of the single-engine airplane's greatest advantages over larger craft. This is the economy of frequent schedules. Frequency of schedules is a major factor in generating traffic. Your passengers are seeking air transportation that will be useful in their affairs and the convenience of departing and arriving schedules goes a long way in determining that usefulness. It may be reasonable to wait several hours for an airplane if the passenger's trip is a transcontinental journey, but little can be gained in waiting very long to start a relatively short journey. Autos, busses and trains are the major competition of short-haul air service operators. For small loads, a single-engine airplane can offer frequency of schedules impractical to operate with large multi-engine transports. This frequency of arrivals and departures in many cases may well be the difference between profit and loss.

First domestic certificated airline to use single-engine equipment since 1930's is Mid-West Airlines, Des Moines. President Andy Anderson of Midwest is shown here with one of a fleet of 5-pl. Cessna 190's which he will use in passenger and mail service to 32 cities. Parks Air Transport, another certificated feeder, plans to use Cessna 190's.
—(Cessna Aircraft Photo.)

When you schedule a trip, consider realistically the 12 factors involved in every flight—(1) passenger loading, (2) taxiing out, (3) run-up, (4) take-off, (5) climb, (6) cruise, (7) prevailing winds, (8) descent, (9) traffic pattern, (10) landing, (11) taxiing in, and (12) discharging passengers and cargo. All of these, with the exception of winds, can be narrowed down in single-engine piloting and dispatching to a total of about 5 minutes. On a short haul, however, 5 minutes will influence your overall ramp-to-ramp time. If you advertise an arrival at 9:30 and departure at 9:40, you should adhere to your schedule.

After making these calculations, you will come up with an estimate of the required flying time and mileage as based on the route mileage and schedules to be flown. Now you can narrow this down by considering such factors as your anticipated percentage of schedule completions, allowances for ferry flights to balance your equipment, charter flying, extra sections where known demands can be anticipated, training flights, test hops and other non-revenue flying. This should lead you to a fairly accurate estimate of total mileage, total hours, revenue miles, non-revenue miles, revenue hours and non-revenue hours.

With such facts to go on, your calculation of costs and revenues should be far more accurate than guesswork or rule of thumb yardsticks based on non-carrier operations. What you want to determine now is how to apply overhead and expenses against mileage flown and anticipated revenues against mileage flown.

Costs and Overhead

Among major points to be considered in estimating operating costs, other than direct aircraft costs, the following are important and should receive careful consideration:

Best available pilots and maintenance are two essentials of any small airline. They more than earn their way through safety, dependable performance and efficiency. Although CAA limits a pilot to 100 hours of flying per month, the Labor Relations Board limits it to 85 hours per month and provides for certain minimum pay standards based on mileage, speed, hours, terrain, and length of service. In

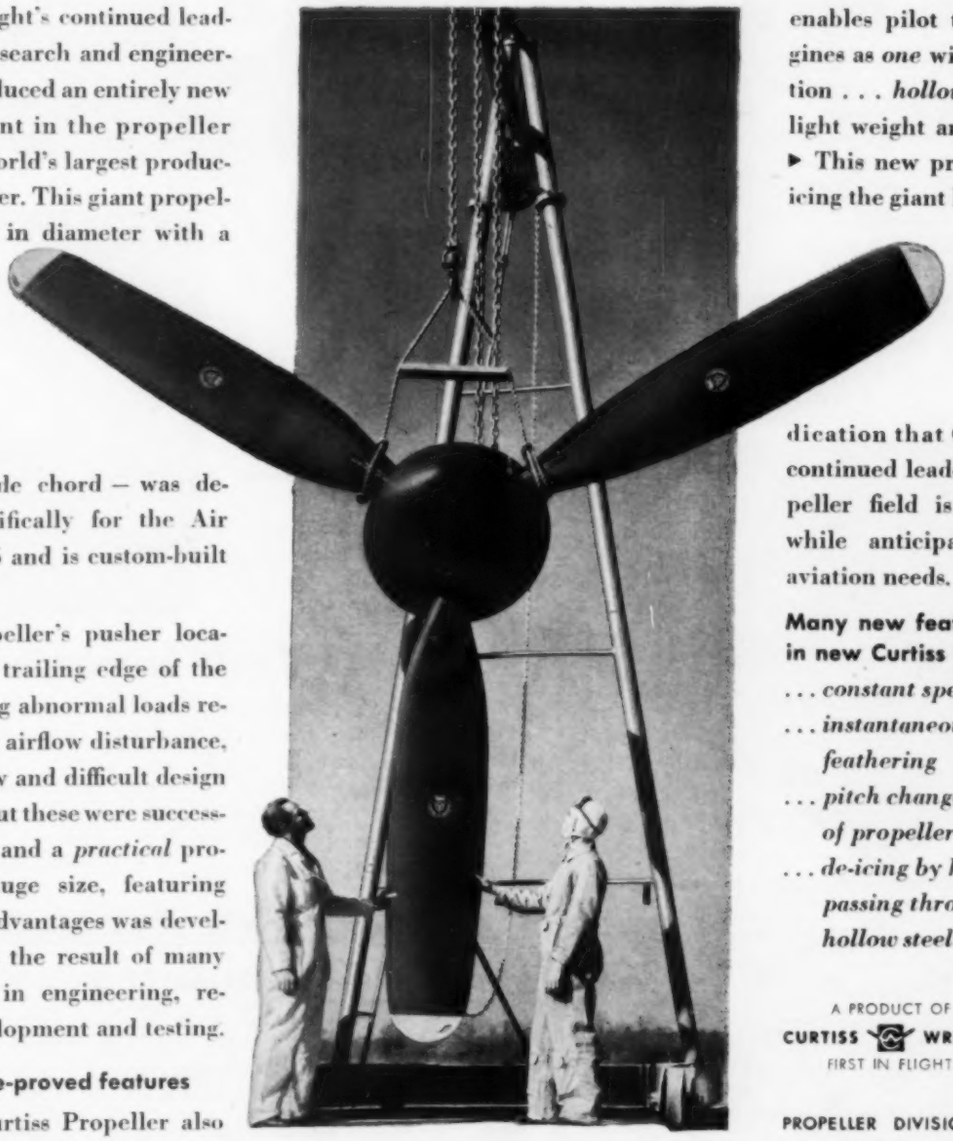
(Continued on page 24)

ANNOUNCING WORLD'S LARGEST PRODUCTION PROPELLER

"Custom-Built" BY Curtiss-Wright

FOR THE B-36

Curtiss-Wright's continued leadership in research and engineering has produced an entirely new development in the propeller field—the world's largest production propeller. This giant propeller—19 feet in diameter with a 21-inch blade chord — was designed specifically for the Air Force's B-36 and is custom-built throughout.



▸ This propeller's pusher location on the trailing edge of the wing, causing abnormal loads resulting from airflow disturbance, involved new and difficult design problems. But these were successfully solved and a *practical* propeller of huge size, featuring many new advantages was developed . . . as the result of many man hours in engineering, research, development and testing.

Many service-proved features

The new Curtiss Propeller also provides *reverse* thrust for smooth, air-cushioned landing and more effective braking . . . *automatic synchronization* which enables pilot to control *six* engines as *one* with single-lever action . . . *hollow steel blades* for light weight and extra strength.

▸ This new propeller now servicing the giant B-36 is another indication that Curtiss-Wright's continued leadership in the propeller field is meeting *today's* while anticipating *tomorrow's* aviation needs.

Many new features included in new Curtiss Propeller

- . . . *constant speed in reverse*
- . . . *instantaneous reversing and feathering*
- . . . *pitch change from rotation of propeller*
- . . . *de-icing by heated air passing through hub and hollow steel blade*

A PRODUCT OF
CURTISS WRIGHT
FIRST IN FLIGHT

PROPELLER DIVISION, CALDWELL, N. J.

CURTISS ELECTRIC PROPELLERS

V.H.F. AVIGATOR - the Leading Air

With Omni Stroboscope

Here's an omni-range indicator that is completely automatic. It gives instant azimuth indication immediately your new VHF AVIGATOR is tuned to a station, eliminating the need for "to-from" meter and "left-right" needle.

Tunable VHF

You tune one knob and one only. But you can turn it for high-ratio hairline precision, or by push-pull throttle action you can sweep the dial for quick scanning.

7 Radios in ONE Package

Having a VHF transmitter and a VHF receiver by no means allows for complete radio navigation. Beside those two functions, five others are important. SEVEN RADIOS IN ONE are provided in your new VHF AVIGATOR for your utilization of ALL CAA airway facilities:

1. 6 Channel Transmitter
2. Tunable VHF Receiver
3. Automatic Omni-range Indicator
4. Range Band Receiver
5. Broadcast Band Receiver
6. Marker Beacon Receiver
7. Remote Controlled Directional Loop

Here's the Omni Stroboscope

With a simple plug-in connection, your new VHF AVIGATOR's Automatic Omni Stroboscope Indicator (shown at right) is a separately-mounted instrument of 3-in. diameter. Its instant azimuth reading eliminates guesswork.

Protects Your Investment

Many exclusive features and versatility make your new VHF AVIGATOR a pilot's complete radio package for years to come. Your first investment is a complete and lasting one. Why clutter your instrument panel and weight down your aircraft with assorted bits and pieces, when your new VHF AVIGATOR can be installed as a replacement without additional space or weight. It saves you money on installation costs and weight . . . it protects your investment for years to come.

Compare V.H.F. AVIGATOR *with other* AIRCRAFT RADIO *Manufacturers*

OMNI	AVIGATOR STROBOSCOPE	NO. 2 TO—FROM METER	NO. 3 CATHODE TUBE
V.H.F. REC.	108-140 MC	108-122 MC.	108-127 Mc.
V.H.F. TRANS.	Lip or Hand Mike 6 Channel 108-140 Mc	Hand Mike 6 Channel 121.5-122.9	Hand Mike 6 Channel 121.5-122.9
75 MC. REC.	FAN & Z-MARKER	NO	NO
RADIO RANGE	195-405 Kc.	NO	NO
STD. Bdcast	540-1550 Kc.	NO	NO
DIRECTIONAL LOOP	ROTABLE AZ-MUTH CONTROL	NO	NO
OUT PUT	Head Phone 300 Loud Speaker 3	Head Phone 300 Loud Speaker 3	Head Phone 300 Loud Speaker 3.5
TRANSMITTER RANGE	2 WATTS 150 MILES	1 WATT 80 MILES	3.5 WATTS 200 MILES
NO. PIECES	1 (one package)	3	3
WEIGHT	13 POUNDS	15 POUNDS	24 POUNDS
PRICE	$581.85	$599.00	$840.52

VHF AVIGATOR SPECIFICATIONS

The output tubes are 6AQ5's and deliver 3 watts radio frequency VHF power and 4 watts of audio frequency power for the loud speaker and 500 miliwatts of power for the headphones. For a more technically inclined reader detailed specifications are as follows: MODEL AT-99-45 V.H.F. AVIGATOR.

VHF RECEIVER

Modulation Capability	R-F Amplifier
12-BA-6	Oscillator and Converter
12-AT-7	I-F Amplifier
12-BA-6	I-F Amplifier
12-BA-6	Detector and Audio Amplifier
12-AT-6 6-AQ-5	Audio Output Stage (VHF, range, broadcast) Modulator

RANGE AND BROADCAST

12-BE-6	Oscillator-Converter
12-BA-6	I-F Amplifier
12-AT-6	Detector and Audio Amplifier, Microphone Amplifier

VHF TRANSMITTER

12-BA-6	VHF Oscillator-Doubler
12-BA-6	Amplifier
6-AQ-5	Doubler-Output

Aircraft Radio designed for Pilots

Nationwide Sales and Service

Better aircraft radio and accessory shops everywhere are praising the new VHF AVIGATOR. Regional distribution centers listed below have already established local sales and service outlets in many areas and more are being added as rapidly as factory production is expanded. VHF AVIGATOR owners are assured of skilled, fast and courteous servicing at reasonable costs.

Rely on Your Radio

Tremendous strides in radio make air transportation by private plane more efficient and useful than ever. Airway aids are steadily expanding. With your new VHF AVIGATOR you, too, can make full use of these valuable facilities. Visit your nearest VHF AVIGATOR dealer today for the most complete one-package radio avigation equipment on the market for lightplane owners. Write the firms listed below for full details. Now, more than ever, you can rely on your radio for safe, sure, dependable avigation.

Dave Rumph Company

P. O. Box 4178, Stockyards Station

Meacham Field **Fort Worth, Texas**

VHF Avigator Factory Outlet for Texas, Oklahoma, Louisiana, and Arkansas

Dealers: Associated Radio, Love Field, Dallas, Texas. Barney's Music, Highland Park Airport, Dallas, Texas. Wilson Radio Co., Meacham Field, Fort Worth, Texas. J. D. Reed Co., Municipal Airport, Houston, Texas. Saxon Aircraft Radio, Gregg County Airport, Longview, Texas. Saxon Aircraft Radio, Stinson Field, San Antonio, Texas. Tomco Aviation Co., Stinson Field, San Antonio, Texas. Wilson Radio Co., Municipal Airport, Tulsa, Oklahoma. Taylor Radio Co., Pounds Field, Tyler, Texas.

Aircraft Radio Laboratory, Turgeon Flying Service, Inc.

Sky Harbor Airport **(Chicago) Northbrook, Illinois**

VHF Avigator Factory Outlet for Illinois

Nan-Bar Air Facilities

Airport: 28000 Cahill Road **Flat Rock (Wayne County), Mich.**

VHF Factory Outlet for Michigan and Ohio

Dealers: Detroit Wayne Major Radio Co., Wayne Major Airport, Wayne County, Mich. Great Lakes Airmotive, Willow Run Airport, Ypsilanti, Mich. Grand Traverse Air Service, Traverse City, Mich. Wayne County Flying Service, Kristport Airport, Farmington, Mich. Pioneeair Service, Wayne County Airport, Romulus, Mich. Michigan Radio Service, Roscommon, Mich. Pontiac Aero Service, Pontiac, Mich. Thunder Bay Flying Service, Alpena, Mich. Fontana School of Aeronautics, Iron Mountain, Mich. Sky Tech, Inc., Municipal Airport, Cleveland, Ohio. Green Flight Service, Youngstown, Ohio.

Cutter-Carr Flying Service

West Mesa Airport **Albuquerque, New Mexico**

VHF Avigator Factory Outlet for New Mexico

Dealers: Associated Callens Flying Service, P. O. Box 693, Roswell, N. M. G & G Airlines Co., Ltd., Rt. 1, Box 322, Tucson, Arizona. Kramer Flying Service, Alamosa, Colorado. Cam-Aero-Flying Service, P. O. Box 485, Douglas, Arizona. Associated Aircraft Sales Co., Municipal Airport, Phoenix, Ariz. Riggs Flying Service, Grand Junction, Colorado. Thomas Air Service, Municipal Airport, Farmington, N. M.

VHF RECEIVER

Range	108 Mc to 140 Mc
Sensitivity	5 Micro-volts for 0.5 watt output
Image Ratio	50 db
I-F Ratio	60 db
Selectivity	band width at 6 db points 50 kc band width at 60 db 450 kc

Undistorted power output 3.0 watts
Maximum output 4 watts

RANGE BROADCAST RECEIVER-RANGE

Range	195 to 405 Kc
Antenna Sensitivity	10 Micro-volts for 0.5 watt output
Loop Sensitivity	200 micro-volts per meter
Image Ratio	70 db
I-F Ratio Selectivity	50 db band width at 6 db points 5.0 kc band width at 60 db points 35 kc

Undistorted power output 2.0 watts
Maximum output 4 watts

BONANZA AND NAVION KITS

Now ready are special VHF Avigator kits for Bonanzas and Navions, designed for easy, low-cost installation. Because the VHF Avigator is all in one package, it involves a minimum of installation work. Kits come complete with necessary accessories.

Manufactured by

Mitchell Industries, Inc.

Camp Wolters **Tel. 285** **Mineral Wells, Texas**

Our new factory and well-equipped research laboratories are supplying aircraft manufacturers with specialized radio installations as well as Avigator, VHF Avigator, VHF Airboy Senior and Airboy Junior aircraft radio stocks and parts for the trade. Organized by Don Mitchell, for 20 years chief engineer of Motorola, Inc., of Chicago, we have under way an extensive research program, pioneering numerous important new radio developments for aircraft owners and the advancement of aviation.

ZERO READER

(Continued from page 13)

runway, we're back to climb power and have some altitude. Now for zeroing.

The heading selector will have to be set on headings to get you where you are going and you have to keep zeroing. When you have climbed to the desired altitude, turn the altitude switch to "On" and you will zero at that altitude. To descend, turn altitude knob to "Off," adjust pitch trim knob, and zero. To level out, turn altitude knob "On" and zero.

The primary use of a Zero Reader is in making very low instrument approaches using a VHF instrument landing system (localizer beam and glide path). So let's navigate over to an airport equipped with ILS and zero some more. In the illustration you will notice the selector switch has "Right" and "Left" on it. After we are over the airport, let's select *blue* "left," for our *outbound* track. The heading selector double-bar is set to outbound track heading. The altitude switch is on, so if we zero we maintain altitude (outer marker altitude or about 1,000 ft. above ground). After we pass the outer marker, maybe a minute or so on past, we change the heading selector 180 degrees to inbound track and move the selector switch from blue "left" to blue "right," which is *inbound*, start a turn in proper direction and just zero instead of flying a procedure turn. As soon as the turn nears completion, move the selector switch to "Approach" (altitude switch drops automatically to "Off" when you select "Approach").

As we cross the outer marker we check our altimeter against glide path and zero some more. Approaching the middle marker we check the localizer needle for center. We also check the heading selector for any difference in pointers as this shows our drift, and we set the double bar to agree with the single pointer. This should get us on the beam. We are getting low now, so we really start zeroing and checking our altimeter and air speed. At the middle marker (generally 200 ft.), we are probably contact by now and can see the approach lights, and soon the high intensity runway lights to complete our landing, plumb zeroed in!

You know a guy ain't never satisfied. I thought up a couple of deals. Seems like holding is a disgustingly common thing. So why not a "Holding" gismo? Twirling that heading selector knob 180 degrees on a 2-minute race track pattern and going from blue left to blue right could plumb tucker out a man, what with zeroing too. Maybe you would even twist the knob

(Continued on page 32)

WHAT'S FLYING AND HOW MANY?

(Continued from page 13)

Mfr.	Model Series	Place	H. P.	Year of Mfr.	No.	Totals
Ercoupe	415	2	65-85	1940-48	4,452	
	Other				30	
						4,482
	(85 Ercoupes have been delivered since this compilation)					
Fairchild	KR	2-3	90-330	1927-31	38	
	FC2	7	420-450	1928	3	
	71	7	450	1928	7	
	22	2	95-125	1931	32	
	24	3-4	95-200	1932-46	637	
	F45	5	330-450	1936-38	6	
	M62	2	175-220	1940-44	4,184	
	Other				738	
						5,627
Ford	4AT	14	660-990	1928-29	8	
	5AT	17	1260	1928-29	3	
						11
Funk	B	2	63-85	1939-48	295	
	Other				6	
						301
General	G180	2	75	1941-43		18
General	Aristocraft	3	125-175	1929-30		7
Globe	GC	2	85-125	1946		1,202
	(All Globe and Temco Swifts now total 1,411)					
Great Lakes	2T1	2	85-160	1929-34		47
Grumman	G21	8	900	1937-44	40	
	G44	5	400	1941-46	149	
	G73	12	1200	1946-48	26	
	Other				63	
						428
Harlow	PJC2	4	145	1938-40	9	
	SI (Interstate)	2	65-113	1941-43	419	
	Other				7	
						435
Howard	DGA	5	285-450	1936-44	276	
	Other				140	
						416
Kinner (Bird)	..	2-4	90-170	1929-35		97
Laird		1-3	220-330	1926-41		10
Lockheed	Vega	5-7	220-450	1928-33	7	
	Electra	12	900-1100	1934-37	18	
	12	8	900	1937-41	35	
	14	14	1800	1938-39	2	
	Lodestar	17	1800-2400	1940-44	129	
	Constellation	60	8800	1945-48	72	
	Other				131	
						393
Luscombe	Phantom	2	145	1934-41	10	
	4	2	90	1938-39	2	
	8	2	50-90	1938-48	4,748	
	11	4	165	1946-48	20	
	Other				116	
						4,896
	(376 2-pl. Luscombes and 52 4-pl. Luscombes have been delivered since this compilation)					
Martin	PBM-5		4200		2	
	202	42	4200	1946-48	23	
						25
Meyers	OTW	2	125-160	1940-43	88	
	Other				3	
						91
Moth (D. H.)	60GM	2	85-90	1929-30		5
NAF	N3	2	235-450	1940-42		462
Nicholas-Beasley	..	2	65-82	1930-32		7
Noorduyn	UC64	8	600	1942-45		158
North American	Super Universal	8	1100	1928-30	1	
	AT-SNU	2	600	1940-44	857	
	BC1A	2	600	1940	10	
	Navion	4	185	1946-47	1,119	
	B25J		3400	1945	8	
	Other				284	
						2,279
Northwestern	Eagle-Lincoln	3	100	1930	6	
	Porterfield	2	40-90	1934-42	465	
	Other				2	
						473
Piper	E2	2	37-40	1931-35	100	
	F2	2	40	1933-34	1	
	V2	2	37-40	1936-37	535	
	J3	2	40-65	1937-43	12,351	
	L4	2	65	..	3	
	PA11	2	65-90	1946-48	705	
	J4	4	65-75		994	
	J5	3	75-100	1940-45	1,204	
	AE1	2	100	1943	2	
	L14	3	100	1945	1	
	PA12	3	100	1946-48	3,098	
	PA14	3	100	1941-45	53	
	PA15	2	65	1948-48	365	
	PA17	2	65	1948-48	148	
	Other				338	
						19,898
	(Piper has delivered 294 Specials, 108 Vagabonds, 139 Family Cruisers, and 405 Clippers since this compilation)					
Pitcairn	PA5	3	220-250	1927-28	2	
	PA6	3	220-250	1928-30	3	
	PA7	3	250	1928-30	4	
	PA4	3	125	1927-28	2	
	PA8	1	330-420	1931	2	
	Autogiros	2-4	160-420	1932-33	5	
	Other				3	
						21
Republic	Seabee	4	215	1946	807	
	Other				21	
						828
Roe	Avro Avian	2	85	1929		1
Roos	American Eagle	3	90-102	1927-31	13	
	Lincoln Page	2-3	90-125	1927-32	8	
						21

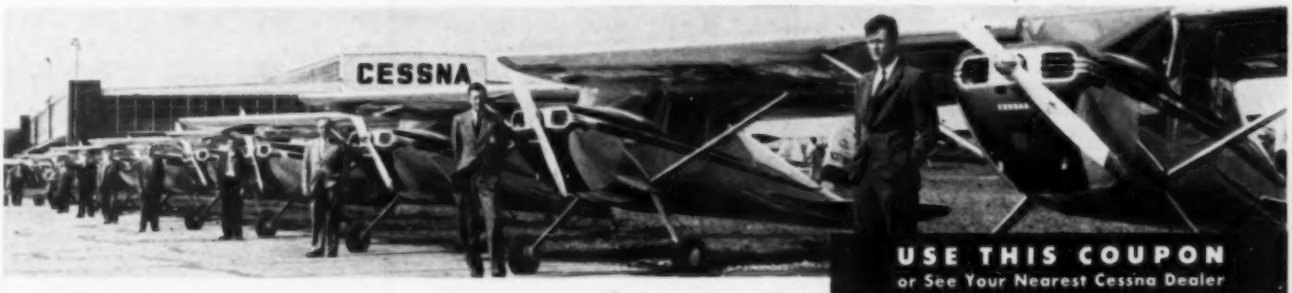
(Continued on page 22)

What is a DAY'S TRIP in the New Cessna 140

A little after sun-up on May 21st, eight pilots from widely separated parts of the country took off for home from Wichita, in their shiny new all-metal Cessna 140's. Their flight was scheduled in advance . . . they took the wind and weather as it existed nationwide that day.

Then came arrival wires from the points on the map above. *All reached home that evening* except one who stopped enroute on business! The eight planes averaged well over 100 m.p.h.—well over 20 miles per gallon of gas!

Suppose it were your sales force starting out . . . or you and your wife taking a vacation. Think of what you could do with the time saved! Today—when production per man is becoming increasingly important—can your business afford to be without airpower? See this remarkable, comfortable, *thoroughly practical* plane at your nearest dealer today!



USE THIS COUPON
or See Your Nearest Cessna Dealer

ALSO SEE:

CESSNA 170

The famous low-cost, 4-place "Family Car of the Air" now all metal! Cruising speed—over 120 m. p. h. Range—over 500 miles.

CESSNA 190-195

Luxurious 4-5 place personal and company airliners . . . yet surprisingly economical to own and operate. Cruise at over 165 m. p. h.

CESSNA LEADS* because Cessna offers "more for the money!"

*In 1948, Cessna sold more personal planes than any other company.

Cessna Aircraft Co., Dept. SF-8, Wichita, Kansas

Please send free literature giving complete description of the Cessna 140 ( ); Cessna 170 ( ); Cessna 190, 195 ( ); Literature for model builders ( ).

Name.....

Street.....

City.....County.....

State.....Phone No .....

BONANZA OWNERS!

- NEW PERFORMANCE
- NEW ECONOMY

The Flight Research AUTOMATIC PROPELLER CONTROL provides **constant speed control** of the propeller affording greatly improved short field operation, economical cruise control, and added engine protection.

The complete CAA approved APC Kit weighs 4 lbs. and can be installed in less than 5 hours. The electronic governor is mounted under the panel; assures positive and reliable operation. **Price only $275.00.**

Write for our Bulletin S-8

•

Factory installation of your complete APC system available at Byrd Airport, Richmond, Virginia.

FLIGHT RESEARCH
ENGINEERING CORP.
RICHMOND, VA.

SEARCH FOR PERFORMANCE

(Continued from page 9)

600 lbs.; gross weight, 1,735 lbs.; span, 30 ft.; length, 21 ft. 4 ins.; wheel tread, 113 ins.; wheel base, 156 ins.; cabin width, 40 ins. All of the foregoing performance figures are with full gross load of 1,735 lbs. and are guaranteed by Meyers within 3 per cent.

What Meyers is after is a $6,000 two-place airplane with performance in the Bonanza's range—a cross-country airplane capable of more than 150 mph. at an economy of about 20 miles to the gallon or so. Apparently he has achieved it. SOUTHERN FLIGHT expects to issue a trip-test report on the Meyers 145 soon.

Experimental Swift 145

Such a 2-pl. will be competing with the Swift 125, but already Texas Engineering & Manufacturing Company has started experimentation on a Swift powered by a 145-hp. Continental. Realistic Robert McCulloch, president of Temco, emphasizes that engineering and market conditions probably will delay any decision to market the Swift 145 until 1950 at the earliest. He also emphasized that its price would probably have to be close to $6,000 as compared with the current price of $4,495 for the Swift 125. No performance goals were mentioned, but the tandem Swift 145 military trainer, also powered by the 145 Continental, is said to be a 150-mph. airplane.

Paraplane for Research

Extraordinary is the word for Lanier Aircraft Corporation's little 2-pl. experimental Paraplane. Powered by a 90-hp. engine with conventional fixed-pitch propeller, it combines a radical airfoil with a small wing to offer exceptional short-field performance. Company information on it does not include specific performance data but is quoted as follows: "The Paraplane takes off after a short run and climbs steeply. It makes a slow, steep descent landing with a flight path similar to an autogiro. Wing area is very small, being approximately 100 ft. The plane has wonderful visibility and amazing maneuverability, even at very slow speeds. It will not slip or skid in banks or turns. The prototype can fly very slowly in the thirties, has a speed of over 120 mph. and makes stalls and spins obsolete. This plane will land and take off in less than 200 ft. The present Paraplane is built for testing purposes and not for the public. It is all steel, and made extra strong and a lot overweight for extremely rough handling. Wing span and length are both 20 ft.

(Continued on page 24)

"BUY NOW" specials

ORDER BY
- **WIRE**
- **PHONE**
- **MAIL**

1. Parachute Sale — Back pack, seat or chest. Not Surplus, Not Army, Not Second hand, but brand new from the factory.
24 Ft. Chutes. Regular List $123.00
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2. Flying Hangars—Keep your ship protected during outside tie-down.
J3 Piper Cub Cruiser 1939-46
J4 Piper Cub Coupe
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T-Craft BL-65, B-12, or L-2
Regular $35.00 ea. Sale Price **$9.95**
3. Propeller Spinners, Model No. 534, for Piper Cubs, Aeroncas, T-Crafts, Ercoupes, and other light planes. Good looking aluminum spinning with mounting bracket.
Regular List $3.50 ea. Sale Price **$1.49**
4. Esquire Jr.—Aviatrix sunglasses with green "6 base" polished and ground lenses. Gold filled frames. List $12.00 pair. Sale Price **$2.95**

All items quoted f.o.b. Burbank warehouse. *Order through nearest PAC Branch.* Include state sales tax with order. All items in limited quantity and subject to prior sale.

PAC
PACIFIC AIRMOTIVE corp.
Aviation's Oldest and Largest Maintenance & Supply Co.
BURBANK, CALIFORNIA
Other Major Bases at
Kansas City, Kan. • Seattle 8 • Oakland 3
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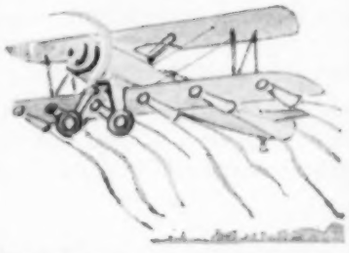
"100% Kill . . . No Plugging or Trails"

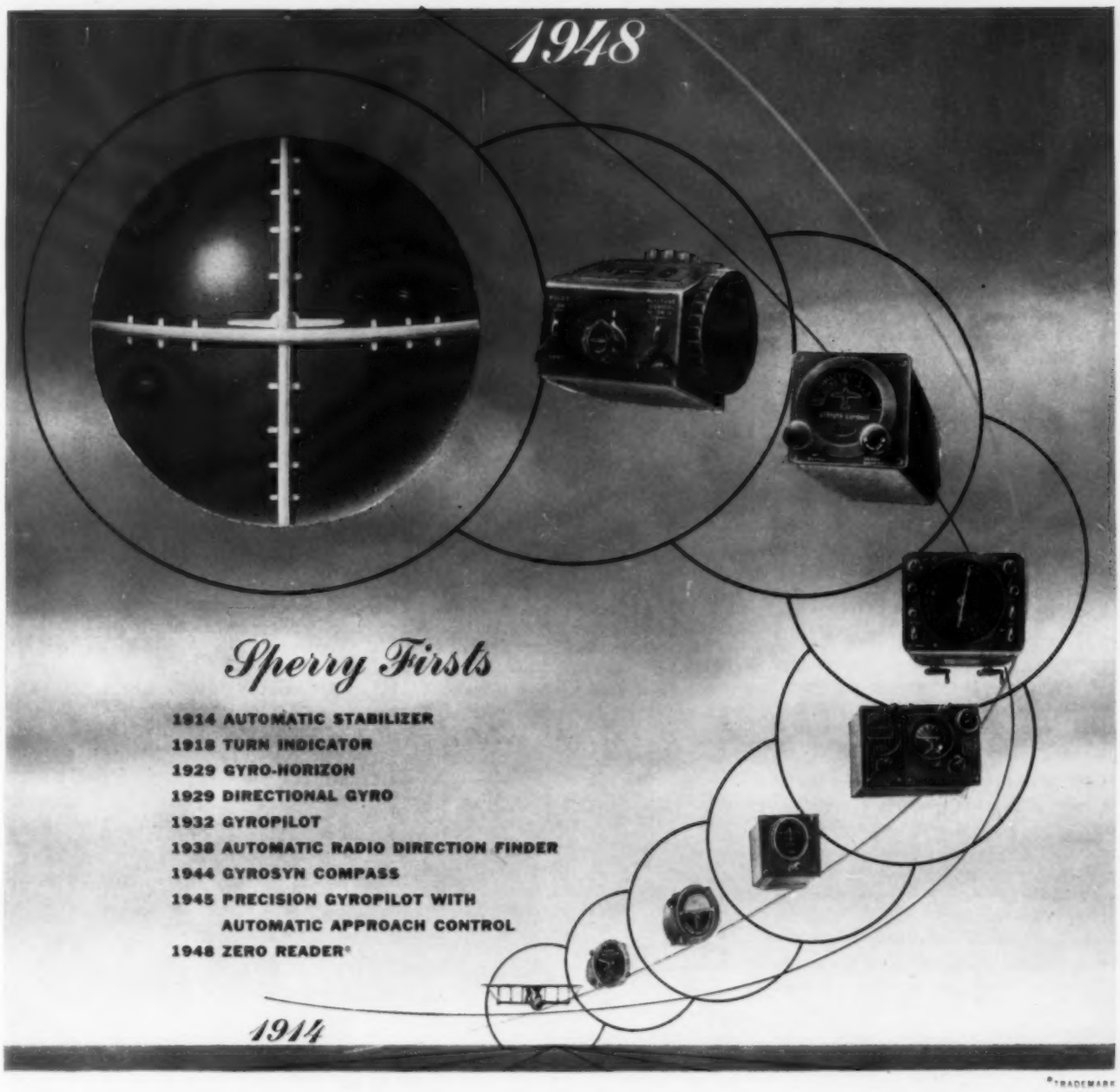


High praise for Burnum Venturi Spray Systems comes from E. P. Stubblefield, Vice President, Rainbow Dusters, Inc., Los Animas, Colorado, as follows: "We have found our Burnum Venturi Spray unit more than met our expectations. We had 100% kill using DDT and Clorodane. With Clorodane we have had good grasshopper control. 2,4-D on wheat and corn is also sure-fire for weed spray with this unit. Maintenance is minimum with no plugging or trails. We sincerely recommend the Burnum Venturi Spray System."

SWITCH TO SPRAY!

You, too, can do the job better with our units, available in handy kit form, fully-approved by CAA. We also stock Stearmans modified into combination duster-sprayers. Send for particulars today.

BURNUM AVIATION CO.
Manufacturing, Sales, Installations of Venturi Liquid Spraying Systems
Lucas Field Arlington, Texas
Tels. 1535W1 and 253W



*TRADEMARK
PAT. PENDING

ZERO reader* —ANOTHER SPERRY "FIRST"

Man's first airplane instrument for automatic flight was the Automatic Stabilizer introduced by Sperry in 1914. Down through the years, Sperry has developed — through pioneering research and engineering — many added "firsts" in aviation equipment.

Now, Sperry introduces the ZERO READER . . . the only manual system approaching the performance of stabilized automatic flight control . . . another progressive step toward development of all-weather operations.

Developed by Sperry with the cooperation and encouragement of All-Weather Flying Division, USAF and the Air Transport Association, the ZERO READER is an example of Sperry's never-ending search for new ways to improve flying techniques.

SPERRY

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No. 6 in a Series Adv.

Radio Reviews

HOW'S YOUR RADIO WORKING? With proper installation and maintenance, it should give satisfactory service for thousands of hours. But like all precision equipment it requires sensible care and use for best performance.

100-HOUR RADIO CHECKS should be performed on all radio-equipped aircraft. This consists of visual inspection and operational test of all equipment, covering such items as antenna, insulators, loose plugs, microphonic tubes, abnormal operation and control head operation. Such preventive maintenance will detect approaching trouble and provide for necessary repair or replacement.

500-HOUR RADIO CHECKS are essential and painstakingly thorough. All gear is removed. All bearings are cleaned and regreased to assure dynamotor dependability. Commutators and inverters are carefully inspected and machined down if necessary. All tubes are checked for necessary replacement and all equipment is retuned where check reveals improper performance, old antennas are replaced if needed.

SOME OPERATE 1,000 HOURS OR MORE without much repair or replacement of parts. It all depends on the kind of service you receive. But periodic checks are valuable in other ways. For example, our aircraft radio research is never-ending and in our large volume of executive aircraft radio servicing we are constantly perfecting new ideas. You benefit from this wealth of practical development, which is applied to every 100-hr. and 500-hr. check we perform.

KNOW-HOW IN RADIO SELECTION, INSTALLATION AND MAINTENANCE is our specialty. Drop in to see us any time and talk radio with our communications specialists.

Dealers for

★ ARC ★ BENDIX
★ COLLINS ★ LEAR

North Texas Distributors for

Doolittle Oil Field, Railway, Taxicab Communications

Associated Radio

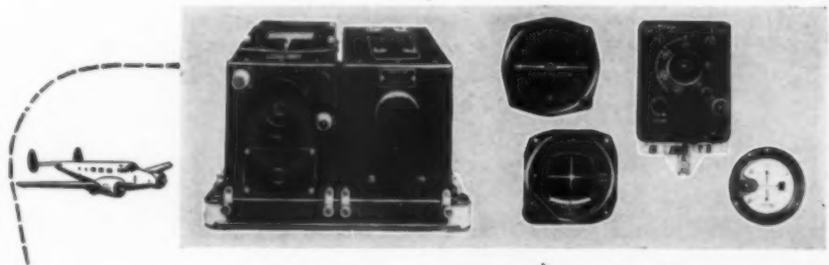
CARL FOX
TONY AGUILAR
LEE LANFORD

LOVE FIELD • DALLAS

WHAT'S FLYING AND HOW MANY?

(Continued from page 18)

Mfr.	Model Series	Place	H. P.	Year of Mfr.	No.	Totals
Ryan	ST	2	125-160	1935-42	620	
	SC	3	145-175	1938-39	10	
	B1	5	220	1928-29	6	
	B5	2	220	1929-30	6	
	B7	2	420	1929-30	1	
	C1	4	250	1931	1	
	Other				49	
						693
	(Navions including North Americans now total over 1,800)					
Spartan	C3	2-3	55-250	1928-31	15	
	7W	5	450	1937-40	23	
	Other				1	
						39
Star	Cavalier	2	65-90	1929-35		5
Stearman	C3	3	220-285	1927-30	21	
	6	2	215	1930-31	4	
	4	1-3	330-450	1929-30	3	
	Other				19	
						47
Swallow		2-3	90	1927-33		6
Taylorcraft	A	2	37-40	1937-38	367	
	B-D	2			7,370	
	15	3			1	
	Other				35	
						7,773
	(67 Taylorcrafts have been delivered since this compilation)					
Timm		2	150-220	1929-43		180
United-Sikorsky	S51	4	450	1946	13	
	S39	4-5	300-400	1930-32	3	
	S43		1600		3	
	S41	14	1150	1930	1	
	S44	39	4800	1942	2	
	Other				19	
						41
Universal	Monoprep	2	90	1929	4	
	Monocoupe	2	65-185	1928-44	242	
	Monocoach	4	220	1929	2	
	MonoporiD	2	125	1929	2	
						250
Viking	Kitty Hawk	3	100-125	1928-33		10
Waco	9	3	90	1926-27	5	
	GXE	3	90-102	1927-30	48	
	125	3	128	1927-29	2	
	Open				494	
	Cabin				583	
						1,132
White	New Standard	5	220-330	1937-42		17



The Magic of VHF

Airborne Equipment for;
OMNI-DIRECTIONAL RANGES
RUNWAY LOCALIZERS
VISUAL-AURAL RANGES
SIMULTANEOUS VOICE
GCA VOICE RECEPTION

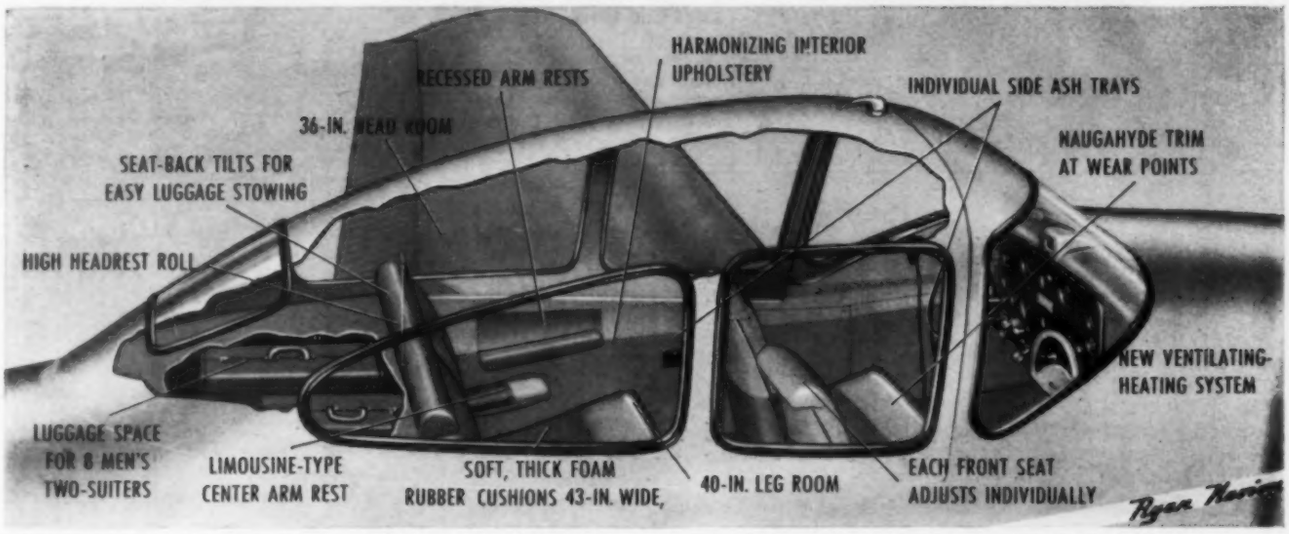
The Type 15A VHF Navigational Receiving Equipment (illustrated) provides for reception on the new Omni-Directional Ranges as well as operation on both types of VHF Runway Localizers, and the VHF Visual-Aural Airways Ranges. Simultaneous voice feature is included on these ranges. The *tunable* A.R.C. Receiver permits selection of any VHF aircraft frequency.

The A.R.C. Type 17 or A.R.C. Type 18 is the companion communication equipment normally associated with the Type 15A. The Type 17 VHF Communication Equipment adds independent two-way VHF communication facilities. The Type 18 adds VHF Transmitting Equipment only. All Type 17 and 18 units are type-certificated by the CAA.

The dependability and performance of these VHF Communication and Navigation Systems spells increased safety in flight. Specify A.R.C. for your next installation.

ARC Aircraft Radio Corporation
BOONTON, NEW JERSEY
DEPENDABLE ELECTRONIC EQUIPMENT SINCE 1928

HERE'S WHY WE SAY RYAN NAVION GIVES YOU AIRLINER COMFORT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36-IN. HEAD ROOM
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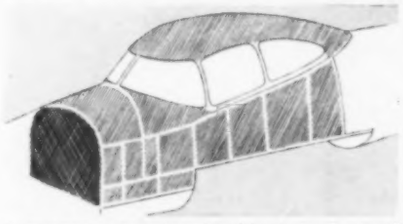
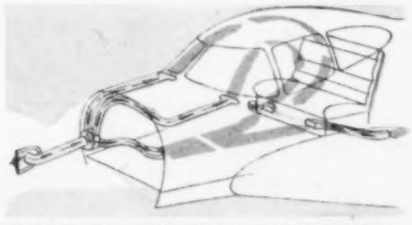
EACH FRONT SEAT ADJUSTS INDIVIDUALLY
Ryan Navion

MOST OF ALL, "comfort" depends on confidence in the design, structural integrity and dependable performance of the airplane itself. And here, *Navion* stands alone... establishes a new standard for the personal-business plane because it is so rugged and easy-to-fly safely. Beyond this, the owner of a "family-size" airplane expects, and gets in *Navion*, actual riding comfort in the "airliner" luxury class. There's room to spare for four big people to stretch out in the deep-cushioned seats. Reliable VHF radio assures long-distance contact. Everything is as thoughtfully planned as in a fine custom-built town car. Just check each *Navion* comfort feature. Then compare!

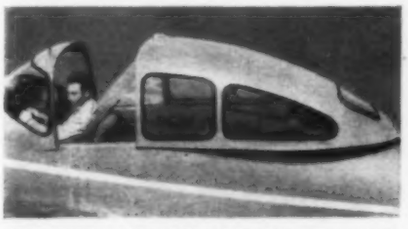


A THICK, "ALL-ROUND" blanket of sound insulation makes cabin amazingly quiet. Exhaust is muffled and discharged under wing. Thick windows and windshield repel noise.



PLENTY OF FRESH OR WARMED AIR is assured with *Navion's* new ventilation...draft-free, living-room comfort for every corner of the cabin. Heater is standard equipment.

BAGGAGE SPACE to spare—room for up to 180 lbs. in 20-cu. ft. luggage compartment. Want to carry bulky loads? Remove 3 seats and *Navion* will handle full ½-ton cargo.



ENTRANCE AND EXIT for all passengers is made easier with *Navion's* exclusive roll-back canopy which opens full 2½-ft. There's room for passengers to change seats safely in flight.

THE EASY, RELAXING way to fly! *Navion* features "two-control after take-off," literally flies itself over long periods. Yet, you have rudder for landings and take-offs.

SMOOTH, "IN THE GROOVE" flying, even in rough air. Cruises at 155 m.p.h., spans an 800-mile economy range with auxiliary tank. Send for your FREE *Navion* booklet.

Ryan Navion

NO OTHER PLANE COMBINES SO MANY FEATURES SO WELL

CHECK THESE NAVION PERFORMANCE FEATURES

• Cruising speed, up to	155 mph	• Landing distance over 50-ft. obstacle, only	875 ft.*
• Normal take-off run	560 ft.*	• Landing speed	54 mph*
• Take-off distance over 50-ft. obstacle, only	875 ft.*	• Rate of climb (first min.)	900 ft.*
• Normal landing run	450 ft.*	• Ceiling	15,600 ft.

**With full 2,750 lb. gross load, zero wind at sea level*

Rely on Ryan **RYAN AERONAUTICAL COMPANY, 608 LINDBERGH FIELD, SAN DIEGO 12, CALIFORNIA**

Flight Parties . . . **This year plan to get more usefulness from your airplane in business and social activities. You can do both at the friendly Flying L Ranch. Wherever you are, the Flying L is only hours away in your plane, awaiting your arrival with superb facilities and service. Everything as you want it . . . hard-surfaced runways . . . service to earn your satisfaction and confidence . . . distinctive, cozy-comfort guest suites just across the turf . . . swimming pool . . . horseback riding . . . fishing in stocked lakes . . . hunting . . . appetizing food around the clock . . . night-time fun-fare.**

¶ Make your flight plans now — next trip visit the Flying L Ranch, 32 miles West of San Antonio at Bandera.

Col. and Mrs. Jack Lapham, Owners

LOCAL AIR SERVICE

(Continued from page 14)

other words, you will need to estimate pilots' pay in accordance with schedules, mileages and flight hours. Some operators may have an idea of paying their single-engine daylight contact pilots on the order of $300 per month. But they will be wise to estimate in advance that the pay will average $600 to $700 or more per month, unless CAB approves requests for exemption from labor act requirements. They must also provide pilots with equipment, supplies, hotel lodging, meals and the like away from base.

When estimating fuel and oil costs, don't make the mistake of simply multiplying total flying hours by consumption rates and then applying wholesale prices effective at any certain base. You'll be buying fuel and oil at several stops along your route. So determine in advance what prices at those stops you will be charged. Also, use accurate figures on public liability, property damage, workmen's compensation and uninsured losses.

In figuring direct maintenance costs, go into the matter thoroughly for aircraft, engine, propeller, radio and instruments. Provide for necessary materials and outside repairs, breaking it all down into separate items. Depreciation of flight equipment is usually based on a five-year amortization with 20 per cent residual value.

Costs as already covered will probably be more readily and more accurately estimated than those for ground and indirect operating expenses. First on the list will be six business departments, although the functions of some of

(Continued on page 30)

PRECISION . . .

In the Rebuilding of Aircraft Engines and Engine Accessories Is Essential to a Good Reputation. Our Customers Have Proven the Reliability of Engines and Accessories Rebuilt by . . .

PRECISION AEROMOTIVE
CORPORATION

MUNICIPAL AIRPORT — WYDOWN —9-1234— — HOUSTON 17, TEXAS

SEARCH FOR PERFORMANCE

(Continued from page 20)

When the wings are folded the design will fit in a space 8 by 20 ft., or the size of an average garage. It can be towed behind a car, if desired."

Extraordinary lift and stability are claimed for the Paraplane's patented "Vacu-jet" airfoil combined with a special wing design. "It acts as a parachute," says the company in referring to the wing. "It is not a fixed arrangement, but is variable to suit any desired flying condition. It is operated by a control in the cabin. More spe-

(Continued on page 32)

ONE-STOP SERVICE IN DALLAS

Featuring the best in service for private planes including Douglas's. . . . Three large hangars. Fully equipped, clean shops. . . . All grades Gulf fuel and oils. . . . Parachute loft. . . . Cafe. . . . Transportation, Hotel Reservations. . . . Hard Surfaced Runways with Clear Approaches.

10 Mi. E. of Love Field — **DALLAS, TEXAS**

the Cutlass
This new Chance Vought fighter, now undergoing performance tests, is expected to be the Navy's fastest.
CHANCE VOUGHT AIRCRAFT
DALLAS, TEXAS
ONE OF THE FOUR DIVISIONS OF UNITED AIRCRAFT CORPORATION
CHANCE VOUGHT

STOP *at these airfields*
LOOK *for the Humble-Esso sign*
LISTEN *to why it pays:*

Humble-Esso fuels and lubricants are unsurpassed in quality. They're products of the world's greatest wartime producer of 100-octane gasoline. And it is a matter of pride with Humble-Esso dealers that their service measures up in quality to the products they sell.

You'll find it pays off in improved performance and lower maintenance costs to fly the Humble-Esso route, to look for the dealers listed below and to choose always the aviation products that are *first with flyers in Texas.*

HUMBLE-ESSO AVIATION PRODUCTS

TOWN	DEALER
Abilene	City of Abilene
Albany	Lone Star Flying Service
Alice	Lynn & Haner
Alvin	Joe B. Ray, Jr.
Anahuac	Sky Harbor Aero
Austin	F. R. Haile Flying Service
Austin	Austin Aero Service
Belton	Reed's Air Service No. 2
Beaumont	Jefferson County
Breckenridge	Breckenridge Flying Service
Brownsville	Frontier Airmotive Co., Inc.
Brownwood	City of Brownwood
Coleman	City of Coleman
College Station	Easterwood Field
Corpus Christi	City of Corpus Christi
Corpus Christi	Glasson Flying Service
Conroe	Conroe Aircraft Sales & Service
Crane	Crane County
Crockett	Carey Mize
Cypress	F. H. Jackson
Dallas	Southwest Airmotive
Dallas	Glen Lakes Aviation Company
Dallas	Texair, Inc.
Denton	North Texas Aviation Company
Eagle Pass	Hall Flying Service
El Campo	Hefner Flying Service
Falfurrias	Falcon Aviation School
Fort Stockton	Gibbs Field
Fort Worth	Aero Enterprises
Galveston	A. C. Flying Service
Garwood	*Garwood Aviation
Genoa	Emmett Flying Service
Goldthwaite	Goldthwaite Airport
Graham	Graham Aviation Service
Greenville	Greenville Majors Aviation
Harlingen	Brink's Aero Service
Houston	Sky Travel, Inc.
Houston	Cliff Hyde Flying Service
Junction	Kerrville Flying Service
Kermit	Kermit Aero Service
Kerrville	Kerrville Flying Service
Killeen	Moyer Flying Service
Lamesa	Frank Hogg Airport
Liberty	Liberty Air Activity
Lufkin	Lufkin Flying Service
McAllen	J. F. McCreery Aviation Co.
Marlin	Rogers Air Service
Mercedes	Smith Aviation Company
Mexia	Mexia Flying Service, Inc.
Mineola	Wisener Bros.
Mission	Hopson-Putz Air Service
Monahans	City of Monahans
Nacogdoches	E. T. Crawford Flying Service
New Braunfels	B & F Flying Service
Olney	Mayhew Aerial Service
Orange	Brownair, Inc.
Pearland	Brockman Aero Service
Port Lavaca	R. L. Tanner
Raymondville	Gorman Fox
Refugio	Fancher Air Service
Robstown	R. J. Cardwell Flight Academy
Rosenberg	Lane Airpark
Saginaw (Ft. Worth)	Saginaw Airport
San Antonio	Williams Aircraft
San Antonio	Monroe-Witt Flying Service
San Antonio	Davis Airport
San Antonio	Leon Valley Airport
Seguin	B. & F. Flying Service
Smithville	Smithville Flying Service
Stowell (Winnie)	Jones Park (B. J. Jones)
Taft	W. J. Worsham
Taylor	Tegge Flying School
Teague	*Gage Field
Temple	Reed's Air Service
Terrell	Mathew Wallace
Texas City-LaMarque	Gulf Coast Airport
Tyler	City of Tyler
Velasco-Freeport	Carter Flying Service
Victoria	Zim-Tim Sky Ranch
Wharton	Wharton Flying Service
Wink	Stoddard Aero Service

* Dealers do not honor credit cards.

HUMBLE OIL & REFINING COMPANY

VOL. XI, NO. 6 AUGUST, 1949

Modern AIRPORTS

THIS MONTH'S MODERN AIRPORT is Tucson Municipal, six miles south of Tucson, Arizona. Operated by Tucson Airport Authority, of which R. W. F. (Bob) Schmidt is manager, it not only is widely praised by airmen for service and facilities but is pioneering a new concept in municipal airport management. Hangar storage is always available for everything from Cubs to DC-4's. Three paved runways are from 6,000 to 6,300 ft. in length and 150 ft. wide and are lighted. Field elevation is 2,595 ft.

—(Tucson Airport Authority by Western Ways Photo.)

In This Issue

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Most 1950 Airport Funds for Big Fields

CAA allots $24 million for Class IV and larger airports; $5 million for Class III and smaller

MOST Federal aid airport funds allocated by the Civil Aeronautics Administration for fiscal 1950 will go into projects of Class IV or larger size, according to latest figures released by CAA covering the program. Only $5,534,192 in Federal funds has been allocated for 172 projects for construction or improvement of Class I, II and III airports. But 141 projects for Class IV or larger airports have been allocated more than four times as much, $24,301,575 being earmarked for the big airports. One seaplane base is planned, involving a $5,000 Federal grant.

Local Funds Total $37,432,752

Local or state sponsors will provide a total of $37,432,752 in matching Federal funds for the 314 projects to be undertaken under the fiscal 1950 program.

For all Federal aid airport work during fiscal 1950, a total of $39,500,000 in Federal funds is involved. Of this, administrative expenses will take $3,000,000, work in the Territories will require $500,000, and $9,000,000 remains in a discretionary fund that may be used by CAA regardless of state boundaries.

Eleven states have not submitted fiscal 1950 programs. There are 18 states where the state apportionment has not been fully covered by approved projects. Legislation is pending to change the apportionment formula from 75 per cent for state apportionment and 25 per cent for the discretionary fund to 60 per cent for the former and 40 per cent for the latter. If enacted into law, this will make possible the programming of approximately $5,000,000 additional money from the discretionary fund to meet the need in some 30 states where project requests far exceed the available funds. This legislation would assure all states the present 75 per cent, provided they have projects ready to be undertaken, according to the CAA.

The accompanying table, compiled from the CAA's release of the fiscal 1950 program and its reports summarizing the 1947-48-49 Federal aid airport program as of May 31, 1949, shows distribution of Federal funds through tentative allocations during that period as well as tentative allocations for fiscal 1950 and the number of completed construction projects:

STATE	Number of Projects Allocated	U. S. Funds Allocated	Fiscal 1950 U. S. Funds Allocated	Number of Construction Projects Completed
Alabama	18	$1,128,031	$ 420,500	4
Arizona	30	1,618,931	752,100	13
Arkansas	20	1,300,888	431,363	6
California	73	7,448,993	2,365,193	15
Colorado	18	1,442,102	416,507	9
Connecticut	5	590,967	170,000	0
Delaware	1	9,096	.....	1
District of Columbia	-	.....	.....	0
Florida	15	1,324,079	756,250	3
Georgia	19	2,621,577	895,510	5
Idaho	76	1,249,806	.....	24
Illinois	25	8,928,397	2,062,300	8
Indiana	17	1,996,974	970,000	4
Iowa	44	2,429,038	633,780	18
Kansas	40	1,687,028	506,275	10
Kentucky	11	1,207,700	418,000	1
Louisiana	19	1,707,251	695,350	9
Maine	7	326,650	.....	1
Maryland	9	1,972,775	530,000	3
Massachusetts	16	1,558,030	804,000	2
Michigan	42	3,475,931	1,249,000	6
Minnesota	41	2,409,142	1,077,000	12
Mississippi	31	1,009,998	.....	4
Missouri	35	2,653,468	664,527	8
Montana	59	1,556,518	.....	4
Nebraska	36	1,690,688	561,299	10
Nevada	10	1,153,574	.....	2
New Hampshire	9	195,955	.....	3
New Jersey	8	1,654,214	585,000	1
New Mexico	26	1,354,824	.....	1
New York	36	8,215,342	2,650,000	6
North Carolina	19	1,433,076	143,575	1
North Dakota	22	421,984	.....	2
Ohio	19	2,641,970	881,000	1
Oklahoma	41	1,770,269	544,359	11
Oregon	40	1,753,993	444,381	4
Pennsylvania	37	5,810,351	2,004,110	5
Rhode Island	1	78,492	550,000	0
South Carolina	10	840,829	171,000	1
South Dakota	19	1,184,639	155,685	1
Tennessee	30	2,220,873	536,125	6
Texas	85	6,692,551	1,738,780	29
Utah	29	1,462,883	376,607	10
Vermont	4	344,748	57,500	2
Virginia	12	1,536,500	645,000	0
Washington	33	2,549,992	278,316	8
West Virginia	8	1,131,392	345,000	3
Wisconsin	31	2,416,437	826,500	6
Wyoming	8	261,909	.....	0
Alaska	6	539,825	.....	0
Hawaii	8	1,078,875	229,000	1
Puerto Rico	2	1,050,000	200,000	0

Airmen's Calendar

Aug. 7-14 — Southwestern Soaring Championships, Grand Prairie, Texas (between Dallas-Ft. Worth).

Aug. 24 — All-State Air Show, Woodrum Field, Roanoke, Va.

Aug. 25-28—National Flying Farmers Convention, Fort Collins, Colo.

Sept. 3-5—Here's the program of events for the National Air Races at Cleveland, Ohio:

Sept. 3—Goodyear Trophy elimination heats; Sohio Trophy (105 miles) race; Bendix Trophy race (cross country).

Sept. 4—Goodyear Trophy semi-finals; Women's AT-6 race (75 miles); Tinnerman Trophy (105 miles).

Sept. 5—Goodyear Trophy finals; Thompson Trophy race (225 miles).

Sept. 18-20—International Northwest Aviation Council, Spokane, Washington.

Oct. 3-8—20th Anniversary Meeting, Ninety-Nines, Waldorf-Astoria Hotel, New York.

Oct. 30—3rd Annual San Francisco Junior Chamber of Commerce Air Fair, San Francisco Airport.

Oct. 30-Nov. 2—National Association of State Aviation Officials Annual Convention, New Orleans.

Jan. 13-15—All-American Air Maneuvers, Miami.

Questions and Answers For Airport Operators

Stay Ahead of City Hall Planning

QUESTION: I have been airport manager in this town for about four and one-half years. During that time I have stuck pretty close to the airport and worked hard to get operations running smoothly. Frankly, there are hardly any kicks. At the present time the city is planning some major improvements and I am worried about the planning. The Mayor has turned the work over to the city engineer and neither one of them has asked me any questions nor have they called me into several meetings they have held with the city councilmen. I don't know what is going on and I am afraid these city hall people lack the experience necessary to do the job they are attempting to do. They may even come up with something so completely foreign to our needs that I won't be able to make it work when it is finished.

The climax came last week when the Mayor and the city engineer started out on a trip to look over some five or six airports in order to get ideas for the improvement of our airport. Two of the airports they planned to visit have absolutely nothing in common with our problem and are poorly planned and poorly operated. When they get back from their trip, I am afraid they will have drawn some wrong conclusions against which I won't be able to fight without losing my job. It seems strange to me that our own city officials will visit other airports and seek the advice of other airport managers and won't ask for my advice. What do you think I should do?

ANSWER: It is mighty hard to tell an airport manager what to do when things have gone along to such a stage as you describe. The best protection a manager has against such a situation is to have taken the bull by the horns before the city hall people started any planning and made your own recommendations. Certainly as airport manager you must have seen the need for improvements and you must have had a fairly clear idea as to the improvements demanded by conditions on your airport. If airport managers would at that early stage lay out in written and plat form the tentative planning required and submit such planning in the form of a report to the city hall, the situation might have very reasonably been saved before it reached the stage you now find yourself facing. In such circumstances your own planning could not have been ignored. Sometimes airport managers devote too much time to operations at the cost of establishing good relations downtown as well as at the field.

Now, however, that you face a situation which you feel will be unsatisfactory, it may be much harder for you to obtain the kind of planning you want. Nevertheless, it is still possible for you to put on paper without rancor your ideas of what should be done and how it should be done. You may even ignore the fact that you know that planning is going on and develop your own report on needs and remedies in such a fashion that it will serve as a check on any unreasonable plan. Even if it sets up an appearance of controversy, it is altogether likely that the Mayor will call you in before he takes any drastic steps on approving the city engineer's plans. We have a feeling that facts, figures, and realistic thinking can usually stop dreaming along the wrong path in planning. Don't be afraid to say what you think but say it without any venom and convey the idea that you are trying to help. After all, if the airport is turned into an unworkable operation as you believe it may be, you probably wouldn't want to stay on the job anyway.

Protect Good Tenants

QUESTION: About a week ago one of the operators from another city went to the city hall and tried to make arrangements for the rental of a hangar which is at present leased by a local firm whose lease expires December 31. He offered a little more money than the present operator is paying the city, and the city councilmen are tempted to accept the offer. This man did not come near me to make his arrangements so I called him up and told him we would not lease the hangar to him under any circumstances and I would not put up with people going over my head to the city hall. Now the Mayor tells me that I am wrong in taking this attitude. He says there is no place for arbitrary decisions and resentment. What do you think I should have done?

ANSWER: We think the Mayor may have some reason for criticizing your action. Perhaps the other operator who went directly to the city hall had been used to dealing with the city hall in his own town. Perhaps, too, he felt that he had a better chance by going to the top city officials. He may not have been attempting to pull a fast one. On the other hand, no matter what his reason for going to the city hall, the matter was brought to your attention, and it might have been very good business for you to find out certain pertinent information before you called him.

First, do you know that your present lessee wishes to renew his lease? If he does, is his business sufficiently profitable to warrant an increase to what appears to be the market value of the property as offered by the out-of-town operator? If that is the case, we think you are justified in giving preference as to the lease to the man who is in business on your airport now and who has established his business and his good will at some expense. If he is not going to renew his lease, then perhaps you have lost a good tenant in the other operator or perhaps he will be able to lease the hangar anyway and between the two of you will be none of the co-operation that makes for smooth relations on an airport.

Second, if your existing operator wants to renew his lease and continue operations on the field, we think it would have been advisable for you to ascertain whether the out-of-town operator would have been willing to lease ground and erect his own building on your airport. If the out-of-town operator believes there is enough business there to warrant his operation in addition to those already existing, you might have found a way either through private money or through public funds to provide the facilities to house his operation with resulting increases in activity, use, and revenues. On the other hand, if in exploring this situation, you found that his main purpose was to drive the other man out of the hangar and off the field purely to get his business, probably he would not consider starting up on your airport in the face of competition.

If you had taken action along that line, nobody would have been able to criticize you or call your actions arbitrary.

CAA Names Airport Advisory Committee

CAA Administrator D. W. Rentzel has appointed twelve members of a new "Airport Advisory Committee" to advise CAA, without fee for one year, on management, operation and maintenance of airports. They are: Region 1, Hervey Law, Port of New York Authority chief of operations; Region 2, Drennon Albrecht, manager of Memphis, Tenn., airport; Region 3, Carl J. Amundson, manager of Grand Forks, N. D., airport; Region 4, Merle Huston, manager of Harlingen, Texas, airport; Region 5, Walter Betsworth, manager of Waterloo, Iowa, airport; A. B. Curry, Dade County Port Authority director, Miami; Donald Martin, Wilmington, Del., airport manager; John Berry, Cleveland, Ohio, airport manager; Louis Inwood, Kansas City director of aviation, and Dr. James E. Mooney, Pinellas County Bureau of Aeronautics director, St. Petersburg, Fla.

LOCAL AIR SERVICE

(Continued from page 24)

these may be assigned to others to reduce the total as far as numbers go (necessary work will still have to be performed, however). These are operations, maintenance, passenger service, traffic and sales, advertising and public relations and general office and administrative, the last of which includes elected officers. For these departments there will be salaries of managers and their staffs, if any; necessary departmental expenses such as telephone and telegraph, rent, purchased items, landing fees, utilities, furniture, supplies and the like.

Index to Uniform Accounting

We recommend that those interested obtain government literature on the uniform system of accounts as provided by CAB for domestic air carriers. Write to the Superintendent of Documents, Government Printing Office, Washington, D. C., for CAB Form 41, which consists of form sheets used by air carriers in computing costs according to the uniform system of accounts required by CAB. Then write to the Civil Aeronautics Board, Washington 25, D. C., for a copy of its manual explaining how to use Form 41 sheets. This will eliminate much guesswork as it goes into finest detail on various and sundry items, detailing completely how to account for all costs and revenues.

In the operation of a small airline for local air service, any one of several basic costs such as station expenses and pilot pay can change overall costs 2 or 3 cents per mile. Such a change can mean the difference between profit and loss.

Communications will be an important operation. Perhaps minimum teletype service, using 3-minute calls in which to cram necessary messages, will suffice. Efficiency here will count heavily in holding down overhead. Station costs will also include rents, telephone, ramp equipment, supplies, landing fees, local advertising and public relations and incidentals. At stops where other airlines are paying landing fees, the small airline will come up against agreements providing that no other airline may receive a more favorable fee arrangement. However, special provision can still be made for small, single-engine aircraft by making landing fees for them also available to existing airlines.

Once anticipated costs of the small airline are determined and then accounted for on a basis of so much per revenue mile, then the operator will be able to more effectively estimate necessary traffic and passenger loads to ascertain commercial revenue. Provision should be made for discounts on round trips, interline revenues, excess baggage charges, and express and freight revenue.

At this point you should be able to establish with considerable accuracy your costs per mile and what your revenue per mile will have to be. We hope the figures will be as encouraging as those we have seen for an intrastate airline using single-engine planes. It is operating 7 airplanes, flying 95,000 miles per month over a route system having six stations. It employes 23 persons, 9 of which are pilots. It operates four round trips daily between two terminals. Past experience of actual operations show that it will break even and barely show a profit by averaging 2 passengers per flight at 6½ cents per mile less a round-trip discount. That provides a revenue of $12,350 per month. Between 90 and 95 per cent of all schedules are completed on an average.

This little airline's future depends on more revenue, either from more traffic as generated by interline agreements or by salesmanship as well as dependable performance, or from U. S. mail. It is providing local air service which larger aircraft of existing design could not provide on a practical basis. (Another article in this series will be published next month.)

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Tradewind Airport — AMARILLO, TEXAS

ATLANTIC AVIATION SERVICE
New Castle County Airport
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BUTLER COMPANY
Aviation Division
Municipal Airport — CHICAGO, ILL.
Drew Field — TAMPA, FLORIDA

BUTTE AERO SALES & SERVICE, Inc.
Municipal Airport — BUTTE, MONTANA

HARTE FLYING SERVICE
Municipal Airport — WICHITA, KANSAS

LONGHORN AIRCRAFT CORP.
504 Driscoll Bldg., Corpus Christi, Texas
(Branch Office) Hangar 602
Stinson Field — SAN ANTONIO, TEXAS

Parks Aircraft Sales & Service, Inc.
Port Columbus — COLUMBUS, OHIO
Municipal Airport — KANSAS CITY, MISSOURI
Palwaukee Airport (Wheeling, Ill.) — CHICAGO

G. E. PENN
Gregg County Airport — LONGVIEW, TEXAS

J. D. REED CO., Inc.
Municipal Airport — HOUSTON, TEXAS
Love Field — DALLAS, TEXAS
New Orleans Airport — NEW ORLEANS, LA.

Roscoe Turner Aeronautical Corp.
Municipal Airport — INDIANAPOLIS, IND.

SOUTHWEST AIRMOTIVE
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Certified Beechcraft Service MEANS . . . . .

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● At any one of the BEECHCRAFT CERTIFIED SERVICE STATIONS you can expect to receive courteous, efficient and complete service. Each Certified Service Station carries BEECHCRAFT parts in stock, employs personnel trained in the BEECHCRAFT Service School, and maintains equipment, facilities and personnel for repairs to BEECHCRAFT airplanes and components. These service stations have the latest handbooks and all current bulletins, receive information from the factory on all of the latest service and maintenance techniques, and otherwise meet the high standards set up by the Beech Aircraft Corporation.

● To obtain the best service from your BEECHCRAFT and for prompt attention to maintenance and overhaul requirements, visit the Certified Service Stations listed. At these Stations you will find sincere interest in your individual service and maintenance problems.

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NATIONAL AIR RACES

SEPT. 3·4·5 - CLEVELAND

WELCOME to the world's greatest aerial spectacle — an action-packed three-day program of dramatic racing activity over the Labor Day weekend, featuring —

$100,000 (Minimum) CASH PRIZES

- ***THOMPSON TROPHY RACE*** — 225-mile closed course high speed classic of the world, tentatively including a jet division. Monday.
- ***BENDIX TROPHY RACE*** — spectacular trans-continental speed dash, including a jet division flown by U.S. Service jets. Finish Saturday.
- ***GOODYEAR TROPHY RACES*** — series of eight closed course speed competitions for 190 cu. in. planes. Daily — Finals Monday.
- ***ALLISON JET TROPHY EVENT*** — jet flying demonstration by U.S. Air Service jets. Sunday.
- ***SOHIO TROPHY RACE*** — 105 mile closed course classic for high speed planes. Saturday.
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ZERO READER

(Continued from page 18)

off! Why not a selector position marked "Holding" that would do all that knob twisting for you every 2 or 3 minutes. Besides, right side traffic separation is just a miss—I mean a myth. And, after chasing an artificial horizon around all these years, it's a natural (7-11) instrument to most pilots, not unnatural (snake eyes, 2, 3 and 12) like ILS indications. Why not one of those little airplanes *in front* of the ZR cross-bars? Maybe it would save us from that quirk that makes us push when we oughta pull? That zeros me. So zero. ★ ★ ★

SEARCH FOR PERFORMANCE

(Continued from page 24)

cifically, the Vacu-jet airfoil could be described as acting like a combination flap, air chamber-air brake, and boundary layer control."

Edward M. Lanier and his father, who built his first airplane in 1907, developed the Paraplane after 17 years of experimentation. Between 1928 and World War II, they made six experimental airplanes of various designs, including a 1931 model "wingless" airplane having an 8-ft. span and using a "Vacu-cell." The firm was incorporated in 1943 to further perfect Lanier patents and to "offer a new airplane and airfoil, the results to be licensed to aircraft manufacturers for the good of the industry." The current model was engineered and built in three years and nine months at the firm's former small shop in Bristol, Pa. It has been test-flown at the Marlton-Medford Airport, Marlton, New Jersey, which is now the company's location.

Next move, according to Lanier, will be to complete all test data for CAA certification. Until then, no specific details will be released. ★ ★ ★

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